# Southern Power & Industry

The Industrial and Power Journal of the Soc

outhwest

ANDS

'as 15%

be 35%

ions are

NOVEMBER, 1957

SPI ... 54th Year

REACHES industrial plants (monufacturing, process, willty and large service) in the South & Southwest.

SERVES plant managers, superintendents, engineering department hoods and plant operating staffs.

PROVIDES information to solve design, installation, operating and plant maintenance problems.



FIFTY CENTS PER COPY

#### EXPANDING TO MEET G

MANUFACTURED PRODUCTS — of U. S. total in 1925 . . . is now by 1975 — phenomenal growth, meeting these Southern markets.

Here a planning engineer measures dimensions and shuffles scale models for Tube Turns' 40% expansion of manufacturing facilities in Louisville.



#### **Allis-Chalmers Pumps Meet Power Plant Requirements**



## Continuous Condenser Service at Detroit Edison's River Rouge Plant

At River Rouge Station, these Allis-Chalmers 84 by 60-inch circulating pumps, driven by 500-hp motors, deliver 73,000 gpm to the A-C condenser.

They play an important part in assuring service continuity at this station. An accurately cast impeller, hand finished and dynamically balanced, assures smooth operation. Other features, including a rigid whip-free shaft, and tube-protected shaft and rubber bearings lubricated with filtered water, have made A-C circulating pumps popular throughout the power industry.

Many customers use Allis-Chalmers test facilities to properly design their intake structures.

You Get **MORE** than a Pump... When You Specify Allis-Chalmers

You can take advantage of Allis-Chalmers wide experience in supplying pumps to all industries. You are assured of modern design, heavy-duty construction and correct application aid — all

adding up to many years of dependable service.

Allis-Chalmers is the only company that can offer you "One-Source" responsibility, with a complete unit — pump, motor and control — all built to work together. For "MORE" information about Allis-Chalmers pumps, call your local A-C office, or write Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin.

A-5216

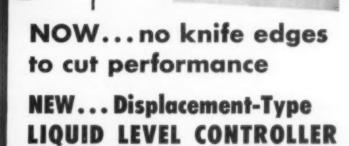
## **ALLIS-CHALMERS**



SOUTHERN POWER & INDUSTRY is published monthly by W. R. C. Smith Publishing Co., Executive and Editorial Offices: 806 Peachtree St., N.E., Atlanta s, Ga. Entered as second-class matter at the Post Office. Charlotte, N. C. Subscription Rates: United States and Possessions, \$4.50 per year or three years for \$3.00; Foreign Countries, \$10.00 per year.

Volume 75

Number 11



Nobody thought it could be done: In one sweeping new approach Kieley & Mueller has climinated the knife edge . . . biggest trouble spot in displacement principle instrumentation.

In place of knife edges which dull in time, the K&M Flexotrol introduces the torque table. It's perfectly centered always . . . requires less torque. It's free-turning . . . only 4 required. Yet it doesn't have a single spot for gunk to collect requiring maintenance, affecting accuracy. A torque tube is employed . . . still the controller is



For installation and operating convenience, the Flexatrol Controller is reversible and rotatable . . . but something more: optional mechanical indication, independent of the pneumatic system, is your final and positive check. Available with all control features including automatic reset.

actuated by a torque rod that does not twist. Both torque tube and torsion table legs are Inconel X . . . a special material resisting corrosion and fatigue alike. Five million cycles has shown no detrimental effect.

The full story is in Bulletin 156-1. Send for your copy.

KIELEY & MUELLER, INCORPORATED

64 Genung Street • Middletown, New York



# ANDERSON HAS THE ANSWER TO YOUR WATER PROBLEMS

In the complete line of ANCO Water-Treating Chemicals there's a product formulated to combat virtually any industrial water problem—and do it cheaper and more effectively.



#### BRAXON AND FLAKO

Liquid and dry boiler feedwater treatments that prevent and remove scale in many types of water. Stop foaming and carry-over.

#### COOLEX

Prevents scale and corrosion in condenser cooling water systems, air washers, chilled and hotwater circulating systems.

#### ALKASTEEM

Protects steam and condensate lines against corrosion caused by the breakdown of bicarbonates in the boiler.

#### SLUDGIT

A liquid fuel oil treatment that dissolves and prevents sludge in storage tanks.

#### OX-GEM

Prevents corrosion caused by oxygen. Eliminates need for oxygen tests.

#### KLEERFLO

A water-clear liquid formula that prevents scale and corrosion in hot-water systems.

#### RUSTEX

Prevents scale and corrosion in humidifying systems.

#### FREE SURVEY AND ANALYSIS SERVICE

The Anderson Service Representative in your area will be glad to study your particular water problems and make recommendations. He will have water samples analyzed in our laboratories shortly after beginning treatment and make any adjustments in the treatment that may be necessary. Similar analyses will continue at regular intervals. There is no charge for this valuable service.

Write, Wire or Phone Today

SPECIALISTS IN MAKING WATER BEHAVE



Anderson Chemical Company, INC.

Box 1424 . MACON, GEORGIA

Phone 5-0466

#### Eugene W. O'Brien Managing Director

#### Vol. 75 No. 11

#### **NOVEMBER**, 1957

#### Francis C. Smith, Editor

Richard L. Priess Asse	ciate Edita

#### Milton C. May . . . . . . Field Editor P. O. Box 11015, Charlotte, N. C.

#### John F. Lee . . . . Consultant on Atomics North Carolina State College, Raleigh, N. C.

#### C. B. Washburn . . . . . Editorial Assistant

#### J. A. Moody ..... Production Mgr.

#### H. Redfern Hollins . . . . Promotion Mgr.

#### BUSINESS REPRESENTATIVES

W. L. Rogers, 7 East 42nd St., New York 17, N. Y. — Phone Murray Hill 2-4959.

James A. Corgee, 27 East Windermere Terr., Lansdowne, Pa. — Phone Madison 6-9145.

D. Parsons, 39 Atlantic Ave., Cohasset, Mass — Phone 4-0712.

Joseph B. Rogers, 16404 Southland Ave., Cleveland 11, Ohio — Phone Clearwater 1-9063

land 11, Ohio — Phone Clearwater 1-9063. Hugh Aull, 333 North Michigan Ave., Chicago T, III.—Phone Central 6-6964.

L. B. Chappell, 8693 Wilshire Blvd., Beverly Hills, Calif.—Phane OLympia 2-1490,

W. Cliff Rutland, P. O. Box 102, Gastonia, N. C.—Phone University 7-7995.

Ray Rickles, 915 Chamber of Commerce Bldg., Miami 32, Fla.—Phone FRanklin 1-0376.

#### Annual Subscription—\$1.50

#### Foreign—\$10.00

#### Published monthly by W. R. C. SMITH PUBLISHING CO. Atlanta, Ga., and Charlotte, N. C.

l'ublishers also of Textile Industries, Electrical South, Southern Hardware, Southern Automotive Journal, and Southern Building Supplies.

W. J. Rooke, Chairman of the Board; R. P. Smith, President; T. W. McAllister, Vice-President; E. W. O'Brien, Vice-President; A. E. C. Smith, Vice-President; J. C. Cook, Vice-President

#### Management Clinic Palletize and Let Fork Trucks Take Over — Tenn. Walk-In Enclosures for Outdoor Turbines Waste Disposal With Drag Scraper - Va. How Dry Is Your Air? Good Lighting a Tool for Production — Part 4 52 Corrosion Stopped — S. C. 58 This Incentive Plan Pays — Ala. Automatic Instrumentation — La. New Turbine Feature - S. C. Check List Prevents Fires Epoxy Resin Grout — Tex. Proper Lubrication — Okla. Atomic Trends of Nuclear Power Technology Better Low Speed Drive — Tex. Hydraulic Elevator Modernized — Tenn. Grease for High Temperature — La.

#### Regular Features — Departments

Employees Help Cut Costs — Ala.

Facts and Trends	. 4	Timely Comments	43
Management Clinic		Buyers Information	88
New Plants & Expansions	12	Book Reviews	95
News Briefs	16	New Product Briefs	96
Industry Speaks		Future Events	102
Index to A	dvertisers	106	

Contents indexed regularly by Engineering Index, Inc.
Copyrighted 1957 by W. R. C. Smith Publishing Company

Editorial and Executive Offices: SOUTHERN POWER & INDUSTRY, 806 PEACHTREE ST., N. E. ATLANTA 8, GA.



# Facts and Trends

November 1, 1957

◆ INDUSTRIAL ENGINE ANALYZER—A cost-cutting look at the inner mechanical functioning of complex industrial engines—without expensive shutdowns—can be made with Sperry Gyroscope's new hand-portable Industrial Engine Analyzer. It displays pictorially the information formerly obtained from as many as three electronic instruments.

It monitors engine operation, providing data on ignition, vibration and pressure. Four quickly-made connections to the engine are required—to the flywheel, ignition primary circuit and two to a power cylinder. All connections can be made without stopping the engine.

◆ LINE-TO-GROUND-FAULTS in 440 volt, 3-phase ungrounded electrical systems can be instantly detected, and both visual and auditory warning given by Delta Engineering Sales Company's (Shreveport, La.) Electronic Ground Alert.

The instrument (portable and stationary units) gives immediate and positive indication of ground faults well before insulation resistance drops to zero ohms (a dead short), thus allowing the trouble to be located and corrected before serious damage occurs.

◆ PRECIPITATOR CONTROL—Electrostatic precipitation units recover dust by passing it through an electrostatic field. Efficiency of the process is dependent upon placing the maximum possible voltage on the gas stream short of "flashover" and it is essential that this voltage be continuously adjusted to the fluctuating characteristics of the gas stream.

A new "low maintenance" precipitator development by Western Precipitation (The "Transistomatic") has no tubes, no relays and no counters. It uses only "all-static" components. Unit is completely sealed in electronic potting compound so that it is unaffected by moisture, dust, humidity, etc.

- ◆ POCKET SIZE pH METER—Lightweight, hand-size pH meter by Beckman gives on-the-spot pH readings (acidity and alkalinity) in the laboratory, plant or field. Measurements in the range of 2 to 12 pH are possible with readability of .1 pH.
- ♠ ALL-GLASS VALVES by Corning Glass are resistant to virtually all acids and can withstand pressures of 50 psi. A two inch valve weighs only nine pounds—1/3 to 1/4 the weight of conventional valves.

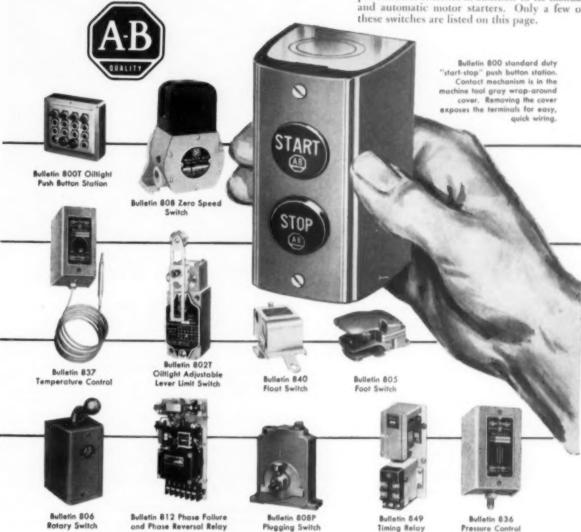
All working parts exposed to fluid are of glass or Teflon. Acidic fluids of all concentrations or compositions at temperatures as high as 250 F can be handled.

The Pyrex valve body is armored with a fiberglas-polyester resin sleeve, which is designed to carry the same work load as the glass valve in case of failure.

# Pilot Control Switches

Allen-Bradley covers the field!

No matter what your needs for pilot control devices may be . . . you can usually find what you are looking for in the Allen-Bradley line. For Allen-Bradley offers a broad selection of pilot control switches in addition to its manual and automatic motor starters. Only a few of



Allen-Bradley Co., 1328 S. Second St., Milwaukee 4, Wis. . In Canada - Allen-Bradley Canada Ltd., Galt, Ont.

# ALLEN-BRADLEY MOTOR CONTROL

#### CONSULT YOUR LOCAL ALLEN-BRADLEY REPRESENTATIVE

ALBUQUERQUE—A & A. Supply Co., 114 Morningside Dr., N. E., Tel. 6-0307
ATLANTA—W.R.Calveriey, 1000 Peachtree St., N. E., P. O. Box 7086, Sta. C., Tel. 178 inity 6-8833
BALTIMORE—H. M. Wood & Co., Inc., 124 Light St., Tel. MUlberry 5-4643-4
BIRMINGHAM—J. L. Howarth Co., Inc., 825 & 22nd St., Tel. FAIrfox 3-1171
CHARLESTON—Henry E. Payne, 918 Kanawha Bivd. E., Tel. D1 3-1393
CHARLESTON—Henry E. Payne, 918 Kanawha Bivd. E., Tel. D1 3-1393
CHARLOTTE—Le Roy P. Spoon, 307 Lincels St., Tel. EDison 4-6334
DALLAS—J. K. Webb, 2810 McKinney Ave., Tel. 1-ylor 3-6179
HOUSTON—Witsen Electrical Equip. Ce., 2210 Gartiew Ave., Tel. Choitol 8-1557
JACKSONVILLE—Bobert P. Smith & Co., 1446 June 15., Tel. EKbrook 8-0531
KANSAS CITY—B. L. McCreary & Son, 1819 Central St., Tel. HArrison 1-1668
KNOXVILLE—Bowditch & Co., 1311-C N. Broodway, P. O. Box 3145, Tel. 4-2513

LITTLE ROCK—Curtis M. Stout, Inc., P. O. Box 107, 400 Shall St., PRanklin 4-8201 LOUISVILLE—Rietze & Co., 2209 S. Floyd St., Tel. McIrose 7-3603 McMPHIS—Curtis M. Stout of Tennessee, Inc., 718 M & M Bidg., Tel. JAckson 6-7601 McMPHIS—Curtis M. Stout of Tennessee, Inc., 718 M & M Bidg., Tel. JAckson 6-7601 McM GRIEANS—Robbins & Robbins, 1037 Magazine St., Tel. Canat 5805 McW GRIEANS—Robbins & Robbins, 1037 Magazine St., Tel. Canat 5805 PHOENIX—E. P. Welfer & Co., 1002 East Rovey Are., Tel. 1-AMburst 6-3168 RICHMOND—H. M. Wood & Co., Inc., 2016 Second Ave., Tel. 3-8529 ST. LOUIS—Harold Julien, 904 N. Grand Bird., Tel. JEffesson 5-1901 SAN ANTONIO—Wilson Elect. Equip. Co., 101 E. Maple St., CApitol 4-244 SAN DIEGO—Janes A. Setchell Co., Inc., 301 W. "G" St., Tel. Eliment 3-3981 TULSA—John W. Elder Co., 1526 East Fourth St., Tel. Diamond 3-9149

Pressure Control

Timing Relay

#### Facts and Trends (Continued)

♣ FULLY AUTOMATIC INSTRUMENTATION—The new 200,000 kw unit of the Sterlington Steam Electric Station of Louisiana Power and Light Company will have a Daystrom operational information system, expected to provide a degree of accuracy and reliability unattained in any previous system.

An Analog-Digital Integrating Translator converts analog values, such as voltages from a temperature indicating thermocouple, into number or digital values which can then be used for computations in high speed digital computers or "brains." Unit is completely transistorized and has no moving contacts. System will cover measurements at 350 points throughout the power plant. Of this total, 100 points will be automatically logged every hour. Details are featured in this issue.

♦ NEW TURBINE FEATURE is embodied in a design being manufactured for the South Carolina Gas and Electric Co. by G-E. The unit will exhaust steam horizontally along the axis of the turbine shaft into the condenser. The condenser is attached directly to the exhaust end of the turbine instead of being located directly below the exhaust end of the turbine as in the usual installation.

This new feature is called "Axial flow exhaust" and, according to G-E engineers, improves the efficiency of the turbine (possible coal savings of 2000 tons/yr for C. G. & E.) and saves in the cost of station (turbine foundation and overall height of the turbine room structure can be lower).

The new turbine is the first of two such units to be installed in a new station located on Lake Murray, adjacent to the Company's Saluda Dam hydroelectric station. Delivery is scheduled for late 1957.

♦ WHAT WOULD YOU DO? One of your men was found to have wrecked a reduction gear deliberately, by throwing a large hex nut into the gear. The man was disgruntled at not having been promoted when an opportunity arose, and this was his way of showing his resentment against his foreman, whom he blamed for his being passed over.

Would you discharge the man immediately? Would you request a resignation in lieu of discharge? Would you transfer him to another department? Do you think there is a hazard in giving him another chance?

For comments on this problem check MANAGEMENT CLINIC in this issue—a new SPI feature conducted by Robert Emerick of North Charleston, S. C.

◆ PUMP MAINTENANCE—Today good pumps are made of materials suited to their jobs. Many, with fluid ends of new, longer-lived alloys, are built to resist corrosion and abrasion longer. They probably represent more investment per pump—but they'll pay off. All they need is better mechanical attention to match their longer life.

Goulds Pumps, Inc. suggests an easy way for you to set up regular lubrication-inspection schedules. They offer, free of charge, a set of Goulds Pump Maintenance Record Cards to help you plan pump repairs during normal plant shutdowns and give you an accurate "history" of each pump. Ask your local representative for further information.



#### Kellogg's Fabricating Abilities Keep Pace

Culminating many months of intensive work with Philadelphia Electric Company, including the testing and evaluation of numerous alloys, M. W. Kellogg is now fabricating the 2,400 ft. of main steam piping, which it will also install, for Eddystone Station Unit No. 1.

Piping is made of Type 316 Stainless, designed for use at 5,000 psi-1,200 F. at the turbine throttle. Calculated minimum wall equals 2.344 infrom Boiler to Sulzer Stop Valves (8 leads), 2.188 in. from Sulzer Stop Valves to Mixing Header (8 leads), and 2.656 in. from Mixing Header to

Turbine (4 leads).

Kellogg's ability to handle the exacting task of bending, welding, heat treating, and testing such huge amounts of heavy-walled pipe to close schedules is a major reason for the company's long-standing reputation in the industry.

The M. W. Kellogg Company welcomes the opportunity to discuss its complete power piping design, fabrication, and installation facilities with consulting engineers, engineers of power generating companies, and manufacturers of boilers, turbines, and allied equipment.



M. W. Kellogg has developed many welding techniques for the fabrication of high alloy steam piping, including K-Weld\*. With this unique technique of are welding, the pipe interior is under controlled inert gas pressure—assuring complete root bead penetration and a highly uniform internal contour without the use of backing rings.

#### FABRICATED PRODUCTS DIVISION THE M. W. KELLOGG COMPANY, 711 THIRD AVENUE, NEW YORK 17, N. Y.

A SUBSIDIARY OF PULLMAN INCORPORATED

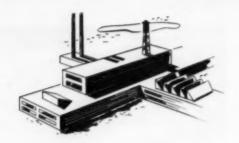
The Canadian Kellogg Company Lid., Toronto « Kellogg International Corp., London « Kellogg Pan American Corp., New York « Societe Kellogg, Paris « Companhia Kellogg Brasiletra, Rio,de Janetro « Compania Kellogg de Venetweis, Caravas



POWER PIPING-THE VITAL LINK

\*Trademark of The M. W. Kellogg Company

## MANAGEMENT CLINIC



Conducted by ROBERT H. EMERICK, North Charleston, S. C.

#### Question

ONE OF OUR EMPLOYEES was found to have wrecked a reduction gear deliberately, by throwing a large hex nut into the gear. We thought at first it was some kind of Communist sabotage, but our investigation brought out that the man who did it was disgruntled at not having been promoted when an opportunity arose, and this was his way of showing his resentment against his supervisor whom he blamed for his being passed over.

Since we have a standard grievance procedure, our first reaction was to discharge the man immediately. However, he begged for another trial, largely based on his having a wife and three children to support. He reminded us also that he probably could never get a new job, with a record of discharge for destruction of his employer's property. The pastor of his church has interceded for him additionally, pointing out that his record has been good except for this one episode.

At the moment we are considering transfering him to another department, but are not certain that this is either right or safe. Next time he might do worse. Meanwhile we have suspended him from duty while we make up our minds. What do you recommend?

#### Suggestion .

AS WE SEE IT, this employee has shown a case of emotional instability which may, or may not, have been cured by the realization of the serious consequences of his act.

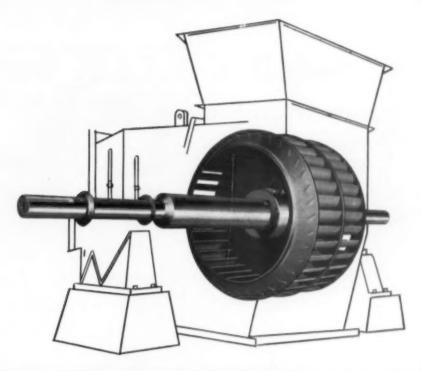
If he is considered a competent workman, he might be worth another chance, but there is some hazard involved. His demonstrated lack of emotional maturity indicates there is small likelihood of his being chosen for promotion, and since his failure to achieve promotion is what caused his tantrum in the first place, he might again, eventually, find his situation intolerable. What the outcome could be, is anybody's guess.

If you decide to keep him on, working in another department, we suggest that the promotion situation be explained carefully to him. Emphasize that he is free to seek better opportunities elsewhere at any time. In fact, a fresh start with a new employer could offer the hope of accomplishment and promotion that appears to be pretty dim where he is now. This he should know.

Incidentally, we do not believe that a requested resignation in lieu of discharge, is a proper expedient. This is a face-saving act at the time, but is soon brought into the open by a prospective employer who takes the time to ask questions. The resignation should be bona fide, and must originate with the employee.

We feel also that the employee should be required to pay for the damage he caused to the gears. This fixing of his financial responsibility for his act, could have a highly beneficial effect on his future behavior wherever he is, and we strongly recommend that you demand payment. If he is unable to make a lump sum payment, the costs can be recovered by regular deductions from his wages.

As the best way out for all concerned, our thought would be to restore him to duty in another department, collect for the damages caused, and urge him for his own good future, to find another employer as soon as he can. Consultation with the company doctor, or the employee's doctor may also be desirable.



#### CLARAGE TYPE DN DYNACURVE FAN OFFERS A

# New Concept

#### IN INDUCED DRAFT WHEEL DESIGN

- 36 radially deep, aerodynamically curved blades impart a dynamic energy to the gas stream to achieve low tip speed operation.
- Unique shape of the blades and rims minimizes shock losses and turbulence at the entering edge of the blades and between the blades.
- Wheel design assures relatively low moment of inertia (WR2).
- Wheel is constructed with a heavy forged steel hub and a sturdy centerplate.
- All welded construction of the wheel provides ample shear strength, tensile strength, and rigidity.

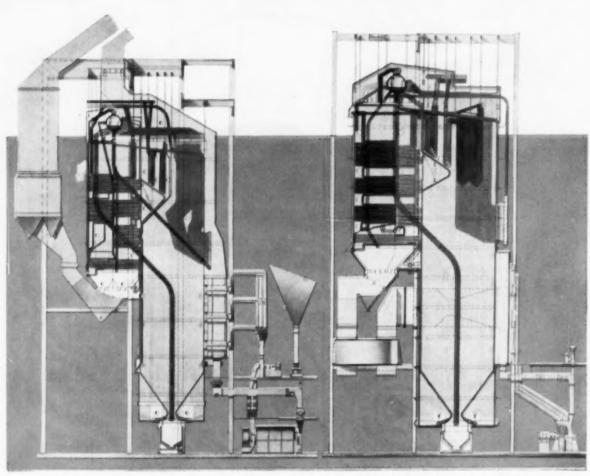
These are only a few of the features that make Clarage's new Type DN Dynacurve Fans fully equal to the most punishing demands.

Write today for Bulletin 905. CLARAGE FAN COMPANY, Kalamazoo, Michigan.

CLARAGE

. dependable equipment for making air your servant

SALES ENGINEERING OFFICES IN ALL PRINCIPAL CITIES . IN CANADA: Canada Fans, Ltd., 4285 Richelieu St., Montreal



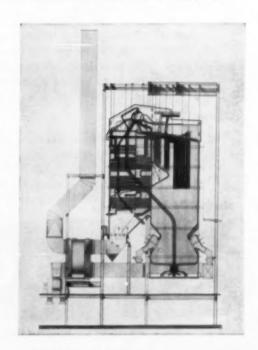
Public Service Co. of Indiana, Inc. — New Albany Two Units — 1,000,000 lbs/hr; 2075 psig; 1005/1005 F Sargent & Lundy, Consulting Engineers

The Hartford Electric Light Co. — Middletown, Conn. 800,000 lbs/hr; 2100 psig; 1005/1005 F Stone & Webster Engineering Corp., Consulting Engineers

# The RILEY TURBO FURNACE

the design of the future that's HERE!

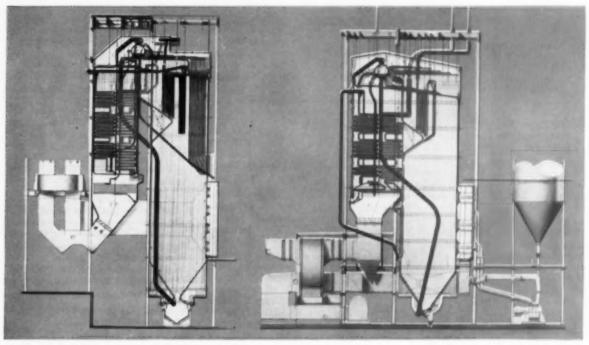
Since late 1955, when this design was first announced, 19 Riley TURBO FURNACE boilers in capacities from 150,000 to 1,600,000 lbs/hr have been sold, eight of them to public utilities. This rapid acceptance is a result of the TURBO FURNACE'S exceptional performance characteristics and its ability to utilize multiple fuels. Users, burning oil or gas initially, can switch to solid fuels in the future without the costly delay caused by conversion of furnace and heating surfaces. A wide range of coal, lignite or other solid fuels can be burned; with fly ash reinjection in the furnace unburned losses are negligible. In addition, the Riley TURBO FURNACE boiler has all burners on one level with a consequent reduction in overall height.



For more information, use Reply Card-Page 89

# Current RILEY Reheat Designs

PULVERIZED COAL FIRED



Central Illinois Light Company — R. S. Wallace Station 690,000 lbs/hr; 1650 psig; 1000/1000 F Commonwealth Associates, Inc., Consulting Engineers

Minnesota Power & Light Co. — Clay Boswell Station, Duluth Two Units — 500,000 lbs/hr; 1725 psig; 1005/1005 f Ebasco Services, Inc., Consulting Engineers

The use by public utilities of Riley Reheat Units for all capacities and steam conditions has climbed rapidly and steadily during the past decade. This gratifying acceptance is the result of the record of performance, dependability and continuity of operation established by Riley units.

The designs illustrated on these pages are typical of those currently being supplied for pulverized coal firing. They are just a few of many Riley central station designs. Let our sales engineers show you others.

A survey of your plant by a consulting engineer could show ways of making surprising savings in your power costs.



Sales Offices: Warcester, New York, Philadelphia, Buffalo, Pittsburgh, Cleveland, Detroit, Chicago, Cincinnati, Charlotte, New Orleans, Atlanta, St. Louis, Kansas City, St. Paul, Houston, DenvertEnglewood; Solt Lake City, Los Angeles, San Francisco, Portland, Seattle.



# **New Plants & Expansions**

- √ Manufacturing Plants
- √ Utility Plants
- √ Large Service Plants

#### South Atlantic

\$120,000 paint manufacturing plant to be erected in Hialeah, Fla. by Spector & Sons . . . Owens-Illinois Glass Co. planning modernization of its pulp & paperboard plant in Jacksonville, Fla. at a cost of \$2,000,000 . . . Doubling water plant output being undertaken by Opa-Locka, Fla. at a cost of \$274,000 . . . Westomatic Mfg. Corp. moving from Citra, Fla. into \$200,000 factory and general offices at Tampa, Fla.

\$1,000,000 training center underway for Chrysler Corp. on 41/2 acre site in Atlanta, Ga. . . . Fall completion anticipated for 30,000 sq ft warehouse and office building in Atlanta, Ga. for O'Neal Steel, Inc. . . . \$3,-750,000 general service headquarters containing 400,000 sq ft underway for Georgia Power Co. on 55 acre tract in Forest Park, Ga. . . . Marks Oxygen Co. planning \$1,000,000 plant in Augusta. Ga. . . . \$600,000 terminal for storage of propane and butane gas planned for General Gas Corp. in Bainbridge, Ga. . . . Clover Mills Inc. to spend \$250,000 on new textile plant in Douglasville, Ga. . has resumed on \$22,000,000 Hartwell Dam project in Elberton, Ga. J. D. Jewell, Inc. planning \$250,000 addition to its poultry plant in Gainesville, Ga. . . Underway is American Coach Co.'s \$500,000 plant in Milledgeville, Ga. for the manufacture of mobile homes . . . Union Bag-Camp Paper Corp. to expand facilities at Savannah. Ga. at a cost of \$40,000,000.

Plans underway for construction of new plant at Farmville, N. C. for American Cyanamid Co.

\$200,000,000 industrial plant to be erected for Shell Oil Co. in George-

town, S. C. . . . Plans underway in Laurens, S. C. for glass textile yarn plant for L. O. F. Glass Fiber Co. of Toledo, Ohio . . . \$400,000 beverageair refrigerated cooling cabinets factory underway in Spartanburg, S. C. for Punxsutawney Co.

\$660,000 building underway for Thompson Products, Inc. in Rocky Mount, Va. . . . Plant expansion project planned for Dawbarn Brothers, Inc. in Waynesboro, Va.

\$8,000,000 plant in Kenova, W. Va. underway for United Fuel Gas Co. . . Plans being initiated for \$742,000 sewage disposal system for New Martinsville, W. Va.

#### **East South Central**

Underway for Monsanto Chemical Co. is 100 x 200 ft chemical plant in Anniston, Ala. . . . Nearing completion in Anniston, Ala. is \$1,500,000 Choccolocco Sewerage Plant . . . Alabama Gas Corp. planning \$500,000 gas plant in North Montgomery, Ala.

\$13,000,000 extraction plant, fractionation plant and pipeline expected to be completed in December, 1958 in Siloam. Ky. for Columbia Gas System.

Plans underway for \$1,224,800 central office building for Southern Bell Telephone & Telegraph Co. in Franklin, Tenn. . . \$300,000 plant planned for Welsh Plywood Corp. in Memphis, Tenn.

#### **West South Central**

\$500,000 plant containing 85,000 sq ft to be constructed in Fort Smith. Ark. for Riverside Furniture Co.... Nearing completion in Jonesboro. Ark. is 89,000 sq ft plant for Colson Corp. while plans are underway for tripling its size.

\$20,000,000 power plant planned for Gulf States Utilities Co. on 400 acre tract in Baton Rouge, La. . . . Copolymer Rubber & Chemical Coplanning to build in Baton Rouge, La. . . \$1,147,879 water treatment plant planned for Bossier City, La. . Olin Mathieson Chemical Corp. planning a research center for Monroe, La. . . \$1,000,000 plant and office building containing 100,000 sq ft planned for Wembley, Inc. in New Orleans, La.

Oklahoma Gas & Electric Co. planning \$1,000,000 limestone extension to its present facilities in Oklahoma City, Okla. . . . \$100,000 warehouse and office building planned for Standard Steel Supply Co. in Oklahoma City, Okla. . . Tulsa Paper Co. planning \$199,500 warehouse in Tulsa, Okla.

West Texas Utilities planning additional power facilities at a cost of \$7,000,000 in Abilene. Tex. . . . \$200,000 factory planned for Sealy Mattress Factory in Brenham. Tex. . . . Coastal States Gas Producing Co. to erect \$1,000,000 office building in Corpus Christi. Tex. . . \$1,000,000 addition planned for Falstaff Brewing Co. in Galveston. Tex. . . General Foods Corp. constructing \$750,000 coffee plant in Houston, Tex. . . \$1,421,000 Southwest Research Center being planned for San Antonio, Tex. .

#### Kansas & Missouri

\$120,000 of improvements planned for Gardner. Kans.'s water treatment plant and distribution system . . . \$331,650 chip treatment and coolant recovery plant planned for Boeing Airplane Co. in Wichita, Kans.

Western Electric Co. to erect \$20,-000,000 plant on 250 acre tract in Lee's Summit, Mo.

These highlights briefed from SPI's SOUTHERN INDUSTRIAL NEWS

SERVICE, a monthly publication issued exclusively to SPI advertisers
and their representatives through the South and Southwest.

# How to get maximum combustion efficiency...measure both combustibles and oxygen

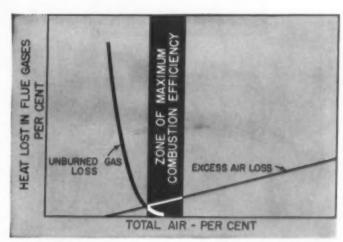
Simultaneous measurement of both oxygen and combustibles is needed to obtain optimum combustion. No instrument that measures only one of these two interdependable factors can give you the full information necessary.

Now, Bailey offers two units, each giving a continuous and simultaneous double check on combustion efficiency: a permanent analyzerrecorder which records both factors on a single chart; and a new light weight, portable unit which indicates both factors.

Both instruments measure: (1) excess air—regardless of the fuel or combinations of fuel being burned, (2) mixing efficiency of your fuel burning equipment by showing per cent combustibles in the flue gas.

Both units are designed to increase efficiency in the furnace operations of the steel industry, on glass tanks, cement and lime kilns, ceramic

and refractory kilns, steam boilers and also on direct and indirect-fired furnaces in the metal processing industries. To prevent your money from becoming waste gas, look



Maximum Combustion Efficiency is secured by keeping the sum of Excess Air Loss and Unburned Gas Loss to a minimum. To do so by the direct method simply measure both oxygen and combustibles in flue gas.

into these two efficiency provers. A Bailey engineer will be glad to give you details or write us for product specifications.

#### For portable use— HEAT PROVER Analyzer



The famous Cities Service HEAT PROVER analyzer is now Bailey built and sold. Weighing only 25 pounds, it is a self-contained automatic analyzer including a sampling tip and hose plus a thermocouple for temperature measurement.

Instrument dials are dual range for greater accuracy and sensitivity.

# For permanent installation Oxygen-Combustibles Recorder



The Bailey Oxygen-Combustibles Analyzer-Recorder coordinates both records on one chart. These records enable the operator to keep fuel burning equipment performing continuously in the zone of maximum combustion efficiency. Excess air may be reduced to the point where combustibles begin to show.

G 40-1

Instruments and controls for power and process

#### BAILEY METER COMPANY

1028 IVANHOE ROAD

CLEVELAND 10, OHIO

In Canada-Bailey Meter Company Limited, Montreal



# now fully

# YARWAY

# REMOTE BOILER



With the addition of the new pressure compensator described on opposite page, fullscale accuracy of water level indication is provided not only at "working pressure" but also at all other boiler pressures.

The Yarway Remote Indicator now offers completely accurate readings of the boiler water level under every operating condition.

For complete information on Yarway Indicators and pressure-temperature compensation, write for Bulletin WG-1814 and new compensator supplement.

#### YARNALL-WARING COMPANY

Home Office:
116 Mermaid Avenue, Philadelphia 18, Pa.
Southern Representative:
BOGKE A. MARTIN, Bons Allen Ruilding, Atlanta 3, Ga.

NOTE: Ask about the application of Yarway Indicators for 900 psi and higher pressures under Boiler Code Case 1155 (two indicators in place of one of the two required gage glasses).



... a good way

# Compensated WATER LEVEL INDICATORS

### ADVANTAGES OF YARWAY PRESSURE COMPENSATOR

- 1. Compensating mechanism is applied to the Yarway indicator without change in internal construction of the indicator.
- Well-known dependability of bourdon tube insures reliability and long life.
- Trouble-free operation because linkage is simple and direct.
- 4. For maximum sensitivity, the indicator pointer is mounted on jewel bearings.
- Rugged shock-resistant mounting carries weight of compensator mechanism without burdening the pointer mechanism.
- 6. Boiler conditions are readily simulated for check of instrument calibration at operating pressures, with remainder of indicator system under atmospheric pressure.
- 7. Application of pressure-temperature compensation for density changes in boiler water insures desired accuracy of level indication at all operating pressures and at all points on the pointer scale.

\*Pressure compensator available on request, at extra cost.



Model showing mechanism of Yarway Pressure Compensator. Placed between indicator operating and indicating elements, the compensator mechanism corrects the level indication by changing pointer travel to compensate for variation in water density due to changes in boiler pressure.

(Not shown) Yarway Remote Hi-Lo Alarm Signals (lights and/or horns), operated by the Indicator. May be placed at any location in the plant.

(Not shown) Yarway Electronic Secondary Indicator to provide duplicate reading at any other location. Same size and appearance as primary indicator.

to specify remote liquid level indicators



# **NEWS**

### for the South & Southwest

#### Industrial Contracts Div. of Avandale Marine Ways — N.O.

Avondale Marine Ways, Inc. of New Orleans, La., well known as a builder of ships and marine floating equipment, has formed a new Industrial Contracts Division. William B. Alexander is Manager of the new Division and George F. Crosier is Sales Engineer.

Avondale formed the new division to consolidate all of its facilities to serve the broad industrial scene. The Company's four divisions include the Main River Yard at Avondale, La., the Harvey "Quick Repair" Yard on the Harvey Canal, the Service Foundry Division in New Orleans, and the Avoncraft porcelain enamel division at Avondale.

The sum of equipment within these 4 divisions together constitute one of the most completely equipped plants for the fabrication of steel, sheet metal, machine shop work, castings and miscellaneous equipment and steel products in the South.

William B. Alexander, General Manager of the new Industrial Contracts Division, was formerly with the Engineering Department at Avondale's Main Yard. George F. Crozier, new Sales Engineer for the Division, recently handled industrial sales work for J. B. Beaird in Shreveport, La. Base of operations for the new Division is located at the Service Foundry Division of Avondale.

Avondale's machine shops, foundry operations, welding facilities, pipe shop and electrical shop will serve the varied industrial market — paper mills, chemical plants, refineries and manufacturers of industrial equipment.

### Parrott New Pres. of Public Utilities Assoc. of the Vas.

John C. Parrott, president of Roanoke Gas Company, Roanoke, Virginia, was elected president of the Public Utilities Association of the Virginias at the group's recent 39th Annual Meeting held at White Sulphur Springs, West Va.

Parrott succeeds Williams J. Stewart. of Wheeling Electric Company, Wheeling, W. Va., as head of the organization of electric and gas utility companies serving Virginia and West Virginia.

Hugh D. Stillman, division manager, Appalachian Electric Power Company, Huntington, W. Va., was elected first vice president, Virginia Electric and Power Company, Richmond, Va., was named second vice president of the utility group.

Officers re-elected, all from Roanoke, Va., were William F. Keehne, system office manager, Appalachian Electric Power Company as treasurer; Arthur T. Ellett. secretarytreasurer, Roanoke Gas Company, as assistant treasurer; and Robert W. McKinnon, executive secretary.

# Three Retorts & One Furnace Anneal Aluminum, Copper Wire at Southwire

The Southwire Company. Carrollton, Georgia, utilizes three retorts with one bell-type furnace to anneal aluminum and copper wire. The single 270-kw General Electric furnace (far right) works effectively with three retorts since heating in this operation constitutes but one phase of the complete heating cycle. A base loaded with reels of coiled wire and covered with a retort, is purged with a controlled atmosphere to prevent oxidation. During the following three-hour heating cycle, temperatures range from 300 to 900 degrees F. Since the total annealing cycle is six hours, the furnace can be kept at the proper heat and moved from one retort to another as required.



#### Wheelabrator — Sales Staff

Francis E. Noyes has been advanced to District Manager of Wheel-abrator Corporation's St. Louis sales territory. He has been a Sales and Service engineer in the territory since he joined the company in 1955.

Wayne L. Hungate, who joined the Wheelabrator Corporation in April, 1957, has been assigned to the St. Louis territory as a Sales and Service engineer.

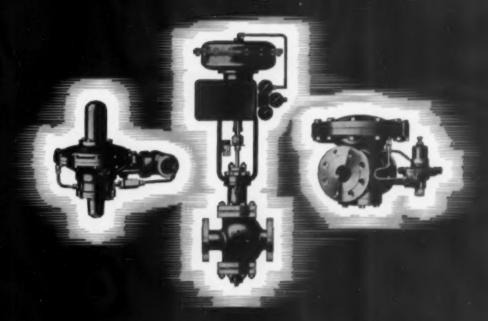
William A. Illsley, Sales engineer in the Detroit territory of Wheelabrator Corporation for the past four years, has been appointed District Manager of the Cincinnati territory.

William E. Scherrer, who joined Wheelabrator Corporation in January, 1957, has been appointed Sales engineer in the Cincinnati territory.

(Continued on page 82)

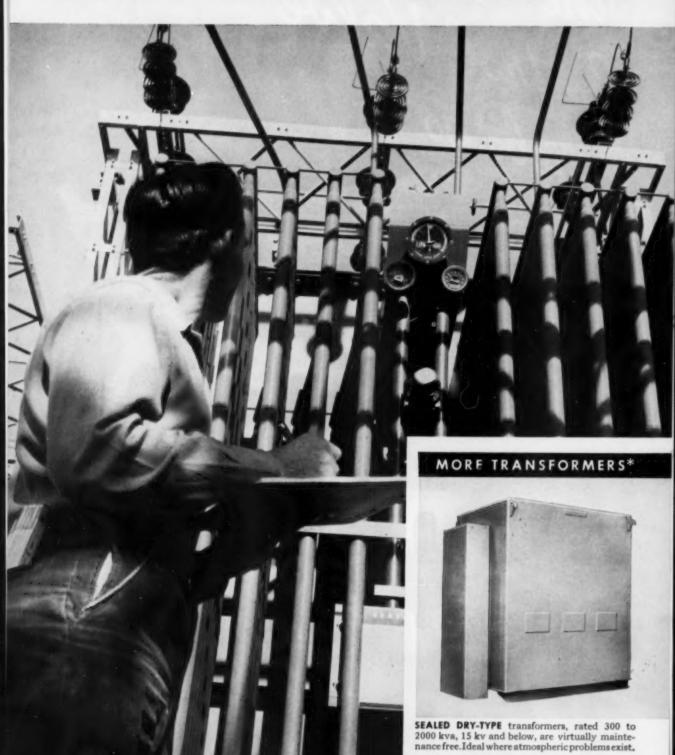
the tough Control Valve Control Valve jobs 90 to





FISHER GOVERNOR COMPANY MARSHALLTOWN, IOWA + WOODSTOCK, ONTARIO

# Reduce maintenance 20% with



# General Electric RM medium transformers

If your new or modernized plant power system calls for transformers 501 to 7500 kva, 69 kv and below, you'll benefit from reduced maintenance on General Electric RM (Repetitive Manufacture) medium transformers.

These G.E features have helped owners cut transformer maintenance time and costs 20 percent and more: Control-center arrangement of instruments and gages makes them easier to read, easier to service.

Full drain permits sampling of oil from the very bottom of the tank, where water or sediment could collect. This allows less frequent, more complete inspections.

Super Melaglyp finish gives you up to 150% longer paint life. A spray-on can is furnished with each transformer so you can touch-up, prevent rust spots.

#### MORE RM MEDIUM TRANSFORMER BENEFITS:

Reduced maintenance is only one of the outstanding benefits you'll receive. Here are more: Faster, less expensive installation—shipped completely assembled, RM medium transformers have features such as ski-tip bases, extra jacking space, and reversible junction boxes which can cut installation time to only four hours.

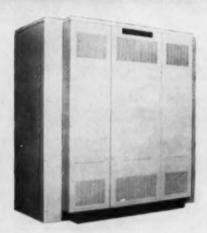
Shorter shipments standardization of design and General Electric's repetitive manufacture process cut shipping time to 10 weeks. Voltage ratings and optional features available make these standard units ideal for most industrial applications.

Before you buy a medium transformer, contact your nearest General Electric Apparatus Sales Office. You'll discover how faster shipment, easier installation, reduced maintenance, and longer life add up to more for your transformer dollar. General Electric Company, Schenectady 5, New York.

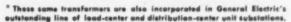
### Progress Is Our Most Important Product

# GENERAL ELECTRIC

#### FOR INDUSTRIAL USE FROM THE COMPLETE GENERAL ELECTRIC LINE



OPEN DRY-TYPE transformers, rated 300 to 2000 kva, 15 kv and below, are used in clean, dry, indoor locations where weight or floor space present problems. Light enough to mount overhead!

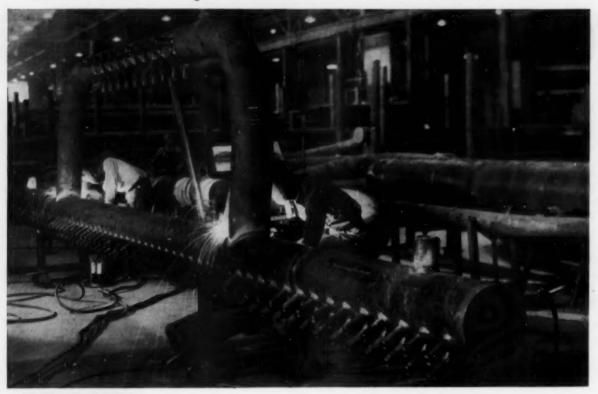




LIQUID-FILLED transformers, rated 112½ to 500 kva, 15 kv and below, conveniently and economically supply small blocks of power. Outdoor units are oil-filled; indoor, Pyranol† filled.

† Reg. Trade-mark of General Electric Company.

#### EXACTLY as you want it . . .





Bending



Stress-relieving



Ultrasonic Testing

#### Shop-fabricated piping by Grinnell

With Grinnell shop-fabricated piping — cutting, fitting, welding, and assembly "on location" is reduced to an absolute minimum. That can be important. For when these operations are performed under the less-than-ideal conditions existing in the field, there is always the possibility of less-than-perfect results. For example, errors in cutting or fitting can occur—or welds can contain slight imperfections, which may be difficult to detect and correct with field equipment.

In Grinnell shops, on the other hand, whole sections of complex piping are assembled exactly as you want it — with every critical point checked with the latest equipment and by the most modern methods. When these sections arrive on site, they go up fast and right.

With Grinnell shop-fabrication too, there are no unforeseen costs. Included in the price (which is determined in advance) are such items of expense as: interpretive engineering, shop sketches and planning, procurement of materials, power services, expendable tools and supplies. There are no charges for waste material.

Consider the quality of the finished job, and final cost. Then consult Grinnell on your next piping installation.

To Engineering Societies and Departments: A 30-minute color sound film showing the quality and economy of Grinnell Shop-Fabrication of all classes of piping is available without charge. Contact your local Grinnell Supply Sales Office, or write to Grinnell Company, Inc. 224 West Exchange St., Providence, R. I.

### GRINNELL

WHENEVER PIPING IS INVOLVED



Grinnell Company, Inc., Providence, Rhode Island

Coast-to-Coast Network of Branch Warehouses and Distributors

pipe and tube fittings " welding fittings " engineered pipe hangers and supports " Thermalier unit heaters " valves
Grinnell-Saunders diaphragm valves " pipe " prefabricated piping " plumbing and heating specialties " water works supplies
industrial supplies " Grinnell automatic fire protection systems " Amco air conditioning systems

WHAT'S SPECIAL ABOUT LJUNGSTROM®

research and engineering

Air Preheater has made many important advances in gas-to-gas heat exchangers over the paid 32 years. Some of the major developments of Air Preheater research are:

- o The mass flow soot blower
- o Multiple-layer beating surface
- Wide-spaced seld and beating surface

e Methods of cold end protection

e Use of alloy steel for cold and material

• Designs of more compact and officially heating surfaces

o Heat transfer surface replaceable during beiler operation

e Superheated slagm for sout blowing

That's why seven out of ten air preheater installations are Ljungstrom. For the full story of its many advantages, write now for your copy of our 38-page manual.

The Air Preheater Corporation 60 East 42nd Street, New York 17, M. Y.

# specialized Can business publication advertising

actually sell?



Snyder, Cleveland District Worthington Corporation

sells to industry

By reputation, salesmen are reluctant to credit anything but their own selling efforts for getting names on the dotted line.

Actually, it's quite a different story. The most successful salesmen will tell you two important things about selling. 1. That the selling process is largely a matter of communicating ideas. 2. And that specialized business publication advertising can help importantly to register information with prospects.

Of course each salesman will express this in his own way . . . but they all agree that selling would be far more difficult without the advertising that appears in the industrial, trade and professional publications that serve the specialized markets to which they sell.

Here, for instance, is what a salesman has to say about this kind of advertising:

#### Says Mr. Snyder:

"We have, of course, sales leads from our business paper advertising that are forwarded to us on a monthly basis. But also the trade advertising has its impact on many who do not at the time request specific information. Worthington is far better known today than it was five years ago, due in no small measure to the aggressiveness of its advertising and sales promotion department.

"Their work makes my job easier. First of all, we have an entree in companies where some Worthington products were not previously as well-known as our original line. We're getting a lot better sales coverage on all products. The Corporation manufactures so many products today that even regular customers may be unfamiliar with some of these products. Through trade advertising and sales promotion we have been able to sell the whole Worthington line.

"Getting back to sales leads-they are particularly helpful to our dealers. In Cleveland, W. M. Patterson Supply will undoubtedly receive inquiries from Worthington's advertising. Scott-Tarbell, Inc., Cleveland Oak Belting, or other dealers handling special product lines will pick up leads from our advertising to help them get business.

"I think we've grown eightfold since the war. This year we hit two hundred million. It used to be that twenty-five million was a good year. The advertising and sales promotion department has aggressively been attacking their part of the problem within the last five years. Prior to that the name Worthington was not nearly so well-known and we put much less emphasis on advertising."

Ask your own salesmen what your company's business publication advertising does for them. If their answers are generally favorable you can be sure that your business publication advertising is really helping them sell. If too many answers are negative it could well pay you to review your advertising objectives-and to make sure the publications that carry your advertising are read by the men who must be sold.

#### How salesmen use their companies' advertising to get more business

Here's a useful and effective package of ideas for the sales manager, advertising manage agency man who would like to get more horsepower out of his advertising. Send for a free copy of the pocket size booklet entitled, "How Salesmen Use Advertising in Their Selling," which reports the successful methods employed by eleven salesmen who tell how

they get more value out of their companies' advertising.

BALESMEN UGE BUSINESS PUBLICATION ABVERTISING BELLING

You'll find represented many intere Some are very ingenious; all are effective. You can be sure that more of your salesmen will use your advertising after they read how others get business through these simple methods.

The coupon is for your convenience in sending for your free copy. Then, if you decide you want to provide your salesmen with additional copies, they are available from NBP Headquarters in Washington, at twenty-five cents each. Or, if you choose you can reprint the material yourself and distribute it as widely as you please. But first, send for your free copy.

Department 2E 1413 K Street, N. W. Washington 5, D. C.	STerlin	g 3-7533
Please send me a free "How Salesmen Use Ad-		
Name		
Name Title		
Title		

#### National Business Publications, Inc.



. each of which serves a specialized market in a specific industry, trade or profession.



The answer is—in any situation where you need urgent help from an outside source.

Say, for instance, you have the responsibility of selecting pipe and tubing for industrial installations. You are planning to enlarge facilities in a paper mill. Your task is to choose a steel analysis that will do the work dependably, efficiently, and at the lowest cost. You know your job, you're confident, but still—it's a big responsibility.

That's when your telephone suddenly becomes your best friend. You pick it up and call National Tube. Our technically trained Mill Service Force, always available for consultation in the field regarding your tubing problems, quickly analyzes your specifications, and recommends the most suitable tubing for the job at the lowest cost to you. It's probably the same analysis that you chose, but at least you have peace of mind, knowing your judgment has been backed-up by 60 years of specialized tubing experience.

And what does this helping hand cost you? Nothing but a telephone call.

National Tube manufactures seamless pipe and tubes in a complete range of steel analyses from low carbon through the alloys up to and including stainless steels. A wide range of sizes and wall thicknesses is available for every mechanical and pressure purpose.

WATCH the United States Steel Hour on TV every other Wednesday.

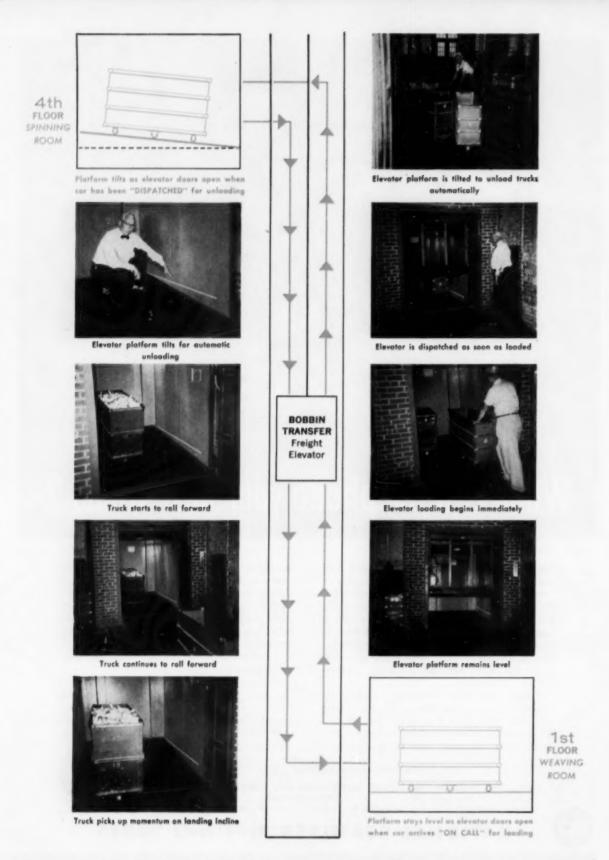
NATIONAL TUBE DIVISION, UNITED STATES STEEL CORPORATION, PITTSBURGH, PA

COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS - UNITED STATES STEEL EXPORT COMPANY, NEW YORK



#### **NATIONAL SEAMLESS PIPE and TUBES**

UNITED STATES STEEL



### TILTING PLATFORM

on automatic Otis Freight Elevators saves cost of operators at

Bemis

The BEMIS BRO. BAG CO. COTTON MILL, Bemis, Tennessee is a typical cotton mill. It spins on the 4th floor and weaves on the 1st floor. It also has a typical cotton mill problem. Bobbins have to be moved continually between the 4th and 1st floors. The traffic flow is constant but not intensive enough to warrant the expense of freight elevator operators.

BEMIS has a "bobbin" transfer elevator at each end of its mill.

To provide better service and eliminate the cost of six elevator operators, OTIS, working with BEMIS designed an automatic elevator with a tilting platform. Its operation is explained at the left.

Here's the sequence of "bobbin" transfer: When the "doffer", who is the employee that takes the full bobbins off of the spinning frames on the 4th floor, gets a full box he takes it to the elevator and presses the "CALL" button for the 4th floor. If the elevator is already there the hoistway doors and car gates open and he loads the box or boxes into the car. He then closes the power-operated doors and gates by means of the door close button located outside. He next dispatches the car to the 1st floor. When the car arrives the doors and gates open and the platform tilts and rolls the boxes out of the car. Boxes are returned from the 1st floor to the 4th floor in the same manner.

An important working feature is OTIS automatic self-leveling. Elevator and floor platforms must be accurately aligned because of the small wheels on the bobbin trucks. Otherwise the free roll-off would be affected.

All freight elevators at BEMIS' plants in Bemis, Tenn. and Talladega, Ala. are under OTIS Maintenance. They're kept running at their original efficiency for a fixed monthly charge. There's never an unexpected, expensive repair bill. All replacements of wearing parts are included in the basic OTIS Maintenance Plan.

# FREIGHT ELEVATOR maintenance

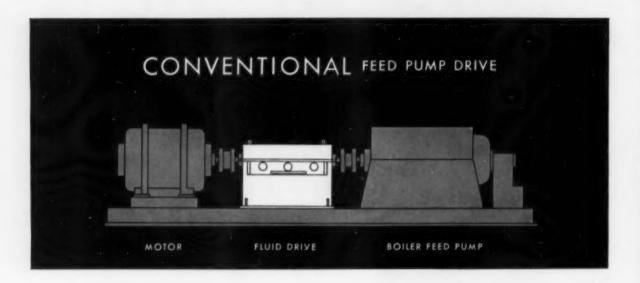
that keeps freight elevators running like new

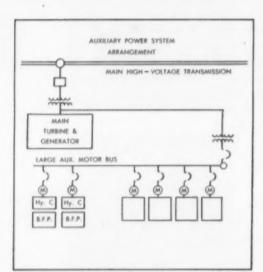


"ENGINEERED SERVICE BY THE MAKER"

OFFICES IN 297 CITIES ACROSS THE UNITED STATES AND CANADA

# How Gýrol. Fluid Drive meets all





Of all power-plant auxiliaries, the boiler feed pump consumes the greatest single segment of invested power. To release more of this power to consumer lines, power plants of all sizes are controlling feed water flow by speed regulation through Gýrol Fluid Drive – driven by a constant speed prime mover,

#### Gýrol Fluid Drive offers several specific advantages:

- It saves power over the entire operating range by eliminating wasteful throttling by valves.
- Fluid Drive's adjustable-speed feature permits reduction in pressure – resulting in further power savings.
- It reduces wear on bearings, and other vital pump parts, by letting the pump operate at speeds that fit boiler demands.
- With Fluid Drive, paralleling of pumps is simplified. Change-over from operating to standby pump is quick and easy.
- Quiet operation is inherent in the design of Fluid Drive, since a "cushion of oil" is the means of energy transmission.



#### TYPE VS CLASS 6

- adjustable speed control
- 250 to 12,000 horsepower
- speeds to 3600 rpm



#### TYPE VS CLASS 4

- adjustable speed control
- 100 to 2500 horsepower
- · speeds to 1800 rpm

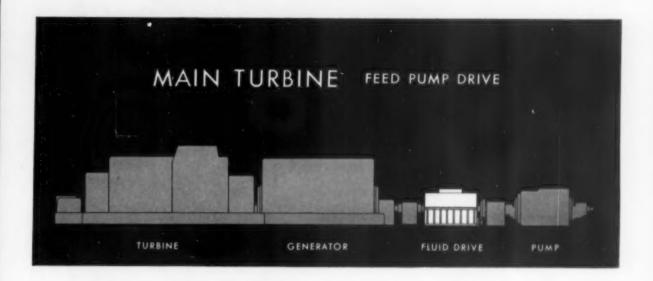


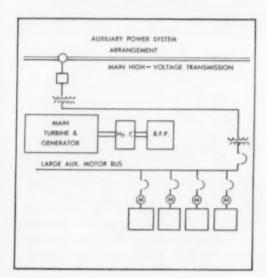
#### TYPE VS CLASS 2

- adjustable speed control
- 1 to 800 horsepower
- speeds to 1800 rpm

## requirements for feed pump control

Regardless of station size, arrangement, or prime mover, you get the advantages of power savings, reduced pressures, and quiet operation with American Blower Gýrol Fluid Drives





Already in the construction stage is the use of Gýrol Fluid Drive for main turbine feed pump drives on some of the largest generating units yet projected.

For example, two of these stations will each drive, through a 12,000-hp adjustable-speed Gýrol Fluid Drive, the main feed pump from the high-pressure turbine. Full boiler capacities will be supplied by the single 5-stage pump, each delivering 6330 gpm against 6400 feet total discharge head when operating at 3510 rpm with feed water at 363° F.

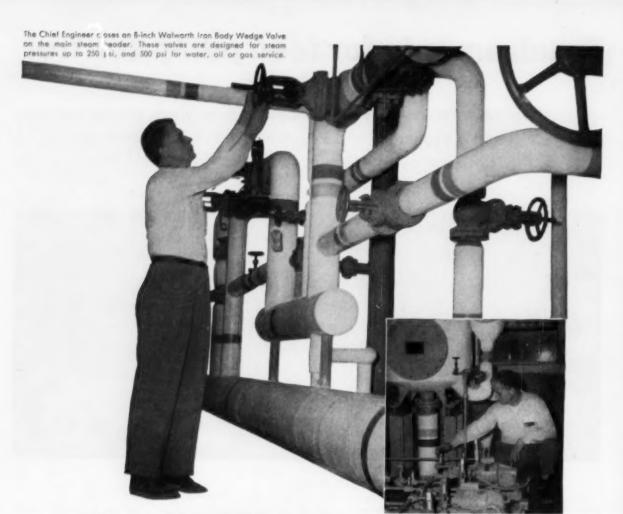
Each pump requires an excess of 11,000 hp, and will be driven from the generator shaft through an adjustable-speed Gyrol Fluid Drive.

In your plans for expansion, why not discuss the advantages of Gýrol Fluid Drive with an American Blower engineer. His knowledge of this application in modern power plants may prove valuable to you. Call our nearest branch, or write: American Blower Division of American-Standard, Detroit 32, Michigan. In Canada: Canadian Sirocco products, Windsor, Ontario.

## AMERICAN BLOWER

Division of American-Standard





"from big gates to

Chief Engineer Bruce W. Martin checks Walworth Bar Stock Valves in chemical feed pump lines to boiler and feed water. These carbon steel valves are built for ratings up to 3000 psi. Stainless steel bar stock valves are also available for very severe service.

little globes"...

The power plant at the Michigan School for the Deaf has an operating capacity of 25,000 lbs. per hour generated by three 200 hp and one 60 hp oil-fired boilers. Built four years ago, the plant is now the responsibility of Chief Engineer Bruce W. Martin who says: "This plant was designed and constructed for efficient operation, and a lot of that efficiency depends on the valves. From big gates to little globes installed here, we use a wide variety of Walworth Valves. They give us the dependable,

trouble-free service we want and expect. I would recommend them to anybody for similar service."

Walworth's complete lines of valves are built to provide long range service and savings. There's a Walworth Valve in a type, size, and material to serve you... Gate, Globe, Angle, Check, and Lubricated Plug Valves in a variety of pressure ratings. The next time you need valves or have a problem concerning flow control, call your Walworth Distributor, or, write Walworth direct.

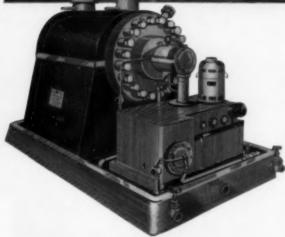
#### WALWORTH

60 EAST 42nd STREET, NEW YORK 17, N.Y.

DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD

WALWORTH SUBSIDIARIES: ALLOY STEEL PRODUCTS CO. . CONOFLOW CORPORATION . GROVE VALVE AND REGULATOR CO. MAIN VALVE & FITTINGS CO. . SOUTHWEST FABRICATING & WELDING CO., INC. . WALWORTH COMPANY OF CANADA, LTD.







#### PACIFIC BOLLER PUMPS

Edison's giant El Segundo steam station. Three Pacific boiler feed pumps were placed in operation for unit No. 1 in 1955. Two more Pacific pumps were selected and went on the line for unit No. 2 in 1956. The combined generating capacity of the two units is 350,000 kilowatts. These Pacifics, each delivering 685,000 lbs./hr. of 360°F. feed water at 2350 PSIG, unfailingly serve Southern California Edison's El Segundo plant needs. Whenever continuous boiler feed service is an absolute must... then nothing but the best, most dependable service will do... Pacific Boil r Feed Pumps!

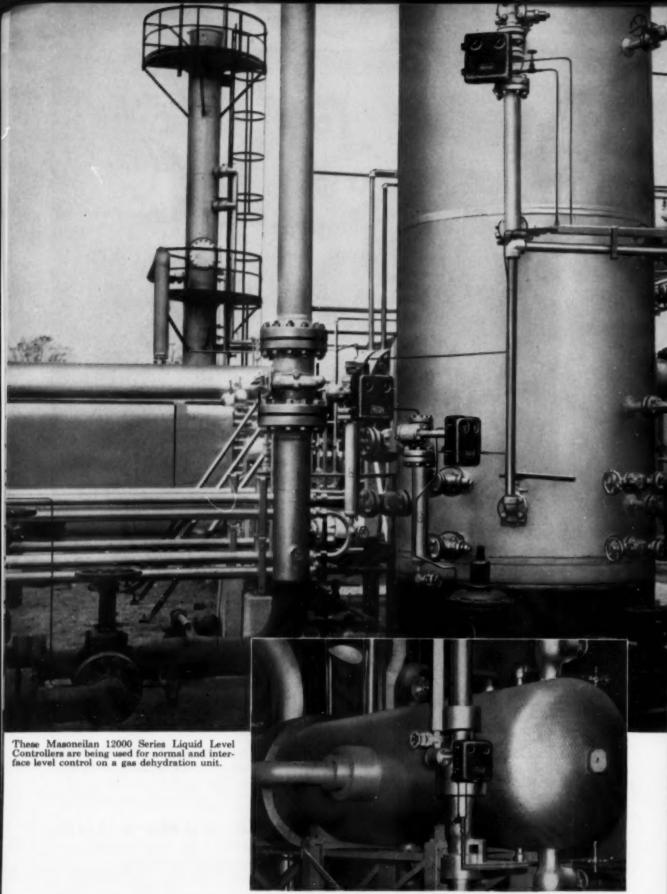
Write for Bulletin 122

#### PACIFIC PUMPS INC.

HUNTINGTON PARK CALIFORNIA
Offices in all Principal Cities

SOUTHERN POWER & INDUSTRY for NOVEMBER, 1957

For more information, use Reply Card-Page 89



This is one of the versatile 12000 Series Liquid Level Controllers on a heat exchanger in a power plant installation.

In Masoneilan 12000 Series Liquid Level Controls . . .

# Five-Point Versatility Solves Processing and Power Plant Control Problems

Here, in one group of related designs, is a completely versatile and adaptable series of liquid level controllers. They offer a one-source solution to the majority of level control problems with flow and storage of liquids in processing and power plant systems. These range, rating and material specifications, and the flexibility in mountings and control types presented with the photographs below demonstrate this important Mason-Neilan advantage . . .

Wide Selection of Ranges — standard ranges include 14", 32", 48", 60", 72", 84", 96", 108" and 120". Ranges with even longer spans can be supplied.

Wide Selection of Pressure Ratings — In the shorter level ranges, standard ratings are from Class 125 ASA in iron to 2500 lb ASA in carbon steel; in all ranges from 150 lb to 600 lb ASA in carbon steel. Under temperatures up to 100° F steel ratings may go as high as 10,000 lb.

Wide Selection of Materials — to meet all usual conditions, a variety of materials is available:

For displacer chambers -- iron, carbon steel, bronze,

carbon molybdenum, chrome molybdenum, stainless steel, Monel, etc.

For displacers — Type 304 and Type 316 stainless steel, Monel, Hastelloy B or C, Durimet 20, copper and solid Teflon.

For torque tube subassemblies — Inconel, Type 316 stainless steel, K-Monel, Hastelloy B or C, nickel, phosphor bronze, Durimet 20, etc.

There are Masonellan 12000 Series models for a multiplicity of applications . . . industry's widest selection of liquid level controllers. Look to Mason-Neilan to answer your problem. Write for catalog.



#### MASON-NEILAN

Division of Worthington Corporation

35 Nahatan Street, Norwood, Massachusetts





#### **Choice of Control Types**

The basic instrument is a proportional controller, left above. In addition, proportional-reset and differential-gap types are available; and pneumatic set may be added for remote pneumatic adjustment of the set-point. Or the instrument may be a pneumatic transmitter instead of a controller. Also, any combination of controllers, or a controller and transmitter, right above, may be included in a single (larger) case and actuated by a common torque tube.



A variety of external mounting types with screwed or flanged connections, plus flanged types for mounting directly on the vessel, provide flexibility in meeting vessel requirements. The instrument may be mounted to right or left of displacer. The chamber types may have a midflange for field orientation. Top and bot-

flange for field orientation. Top and bottom flanged connection shown at right.

# with DETROIT STOKERS

Coal is the economical fuel in most industrial areas. Safest to handle and store, its steady and continued supply is assured by huge reserves.

With a Detroit Stoker you can burn coal the modern way . . . saving 10% to 40% over other fuels.

Detroit Stokers are dependable, durable . . . last for decades. There is a type of Detroit Stoker to meet your needs.

Let us show you the savings available. Recommendations by our engineers will cost you nothing.

#### DETROIT ROTOSTOKER



Spreader stoker. Economically burns all grades of Bituminous oal or Lignite. Power, hand dumping or stationary grate types.

#### DETROIT LOSTOKER



Compact underfeed stoker for smaller boilers. Capacities 3,000 to 12,000 cleaning. Coal feed and air supply may be automatically

#### DETROIT ROTOSTOKER-

(Continuous Cleaning) Reciprocating grates that slowly discharge ash at front. Steaming capacities from approximately 5,000 to 75,000 pounds. Smoke-



## (Detroit UniStoker)

Side cleaning, underturbine driven. Adjustmanual and automatic control. Capacity range 12,000 to 24,000 pounds steam per hour.



#### **DETROIT ROTOGRATE STOKER**



Spreader stoker for higher capacities up to 400,000 pounds. Forward moving grates that discharge ash at the front. Higher burn-ing rates for longer periods. Heavy duty.

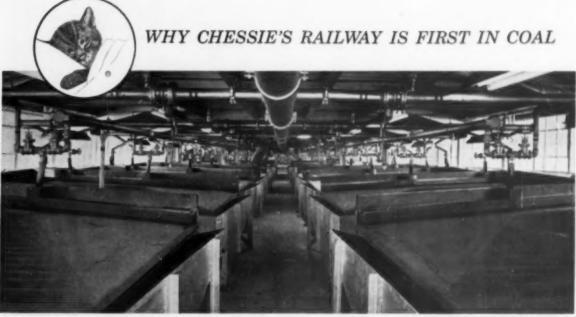


#### DETROIT DOUBLE RETORT STOKER

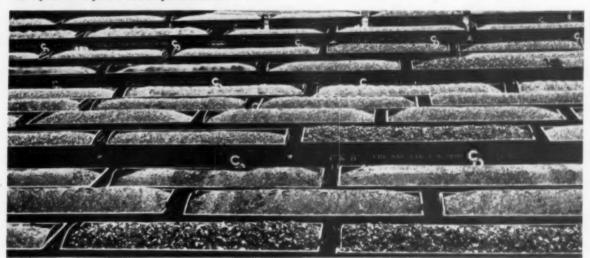
Side cleaning heavy duty underfeed stoker with two retorts, mechanically driven. Available for capacities from approximately 20,000 to 34,000 pounds steam per hour, Requires no

#### DETROIT STOKER COMPANY

MAIN OFFICE AND WORKS . MONROE, MICHIGAN District Offices or Representatives in Principal Cities



**SUPERIOR COAL.** This large battery of washing tables is an example of the modern methods used by producers on the C&O. The naturally superior coals found in the Chessie area can be sized and processed to meet your own particular requirements.

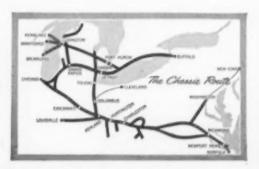


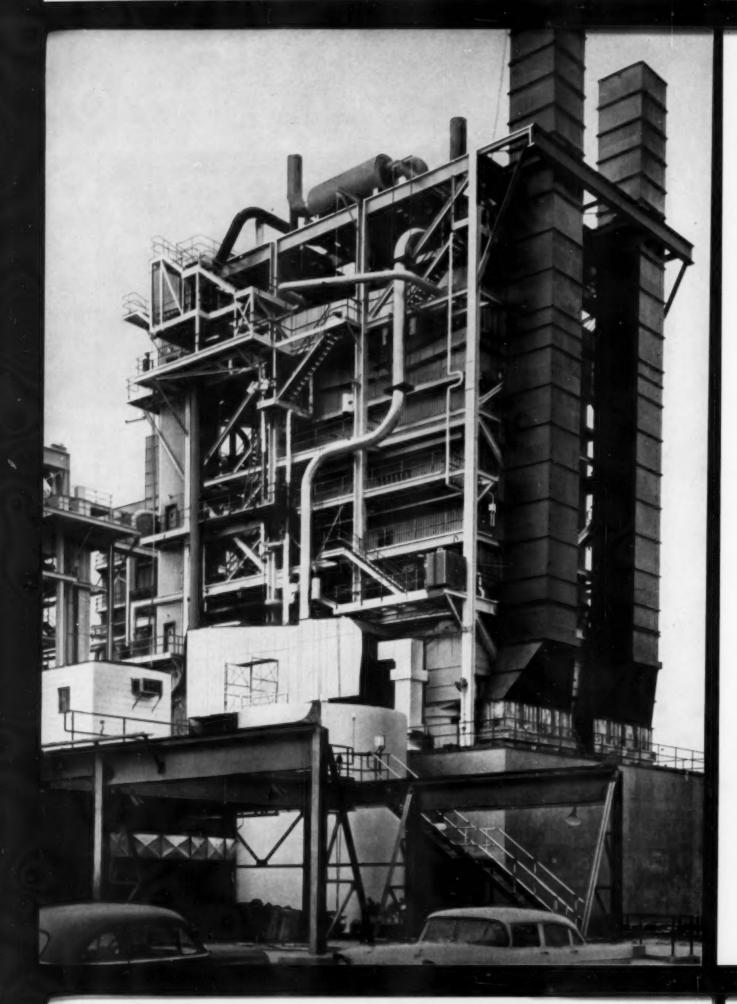
**SUPERIOR SERVICE.** With the world's largest fleet of coal cars, C&O's accelerated repair program continues to keep them in better than 99% good order. Plenty of cars, plus ample motive power and modern yards and signal systems assure prompt and efficient service.

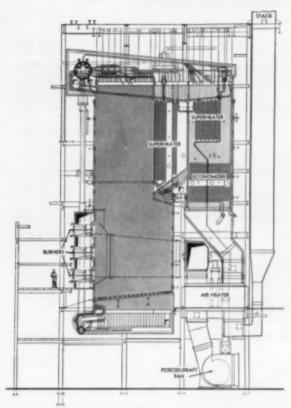
For dependable sources of top quality coals, contact coal producers on the C&O. And for specific help in meeting your own fuel requirements, write to: R. C. Riedinger, General Coal Traffic Manager, Chesapeake and Ohio Railway Company, Terminal Tower, Cleveland 1, Ohio.

#### Chesapeake and Ohio Railway

WORLD'S LARGEST CARRIER OF BITUMINOUS COAL







Third B&W Boiler at Parkdale Station of Dallas Power & Light Company has a capacity of 1,050,000 lb of steam per hr at 1550 pai at superheater outlet and 1005 F. Design pressure 1725 psi. Consulting Engineers: Ebasco Services, Inc., New York.



B&W Cyclone Steam Separators help insure clean, dry, high-purity steam output for the turbine, keeping it on the line for longer periods between cleanings.

# Another B&W Boiler for Dallas Power & Light Company

Third unit at Parkdale Station with B&W Cyclone Steam Separators provides clean, dry, high purity steam. Provisions in design for future coal firing

A B&W Pressurized-Furnace Boiler, the third at Parkdale Station, has gone on the line for the Dallas Power & Light Company. The latest unit, now fired by gas has design provisions for future addition of a hopper bottom and division wall for coal firing.

B&W Cyclone Steam Separators insure clean, dry, high purity steam output for the turbine. In the original design phase of B&W units, features are included to fit specific needs—and the future needs—of the purchaser. When a unit is designed, provision can be made for alternate systems of firing, depending upon future fuel availabilities. In the new Dallas Power &

Light unit, conversion to future coal-firing can be accomplished should conditions in the area so warrant.

National network of B&W plants and engineering facilities provides important advantages. Service and assistance is always near at hand from a nearby link in this chain. Supported by nearly a century of steam generating experience, B&W design, research and development can help you and your engineers with your central station requirements. The Babcock & Wilcox Company, Boiler Division, 161 East 42nd Street, New York 17, N. Y.





BOILER

## Guide to better pump selection

for

specify

boiler feed condensate return hot and cold liquids chemicals refrigerants, etc.

up to 200 gpm. pressures to 900 ft.



F-M WESTCO PERIPHERAL PUMPS

High pressure at normal operating speeds. Handle widely varying heads with little change in capacity. Sizes 1½" through 2½".

hot and cold liquids liquid circulation nonviscous liquids boiler feed cooling towers, etc.

up to 900 gpm. pressures to 525 ft.



F-M BUILTOGETHER CENTRIFUGAL PUMPS

General-purpose, close-coupled

pump and motor units mount in any position—horizontal, vertical or angular. Sizes ¾"

through 5".

sewage slurries paper stock fruit shrimp vegetables, etc.

up to 30,000 gpm. pressures to 175 ft.



F-M NON-CLOG PUMPS

Unexcelled for clag-free handling of liquids with solids in suspension. Sixes 2" through 20". Vertical or horizontal. Bladeless or conventional.

water supply plant service booster circulating air conditioning refrigeration chemical liquids boiler feeds, etc.

up to 50,000 gpm. pressures to 700 ft.



F-M SPLIT-CASE CENTRIFUGAL PUMPS

High, sustained efficiency over wide range of conditions. Lowcost maintenance. Sizes 1½" through 36". Single stage or multistage.

hot and cold liquids
chemicals up to
circulating liquids
nonviscous liquids
cooling towers to 250
condenser circulation, etc.

up to 100,000 gpm. pressures to 250 ft.



F-M END-SUCTION PUMPS

A wide line of rugged, precisionbuilt pumps. Sizes ¾" through 54". Horizontal or vertical centrifugal.

### FOR LOW-COST PUMPING SPECIFY FAIRBANKS-MORSE

Need new pumps? Your Fairbanks-Morse Dealer has the world's greatest variety for you to choose from. Need help in selection? Your F-M Dealer and F-M Sales Engineer will help specify the right type, right size pump and driver for lew-cost, foolproof operation. Call them today, or write Fairbanks, Morse & Co., Dept. SPI-11, 600 So. Michigan Ave., Chicago 5, Illinois.



FAIRBANKS-MORSE

a name worth remembering when you want the BEST

PUMPS . SCALES . DIESEL LOCOMOTIVES AND ENGINES . PLECTRICAL MACHINERY . RAIL CARS . HOME WATER SERVICE SQUIPMENT . MAGNETOS



### DECIDING ON AIRFOIL? INSIST ON "BUFFALO"

Mechanical Efficiency
up to a True 92%

MAXIMUM FORCED-DRAFT PERFORMANCE UNDER SPECIFIC CONDITIONS

WHEN YOU INSIST ON 'BUFFALO' AIR-FOIL FANS you immediately find many important factors in your favor. "Buffalo" Airfoils give you true mechanical efficiencies up to 92%. Main point here is that "Buffalo" Airfoil Fans will positively live-up to their ratings. They are designed, engineered, built and tested to deliver these peak efficiency ratings. You can rely on "Buffalo" Airfoils to meet your performance specifications.

There are sound engineering "reasons why" behind the proven performance of "Buffalo" Airfoil Fans. "Buffalo" offers unique, deep-blade airfoil design plus a brand new approach to streamlining. Turbulence is reduced to an absolute minimum because of the smooth inlet bell

— the matching curved wheel flange — the new "Buffalo" divergent outlet. And with "Buffalo", you get more than an airfoil fan — you can choose from a complete line of airfoil and semi-airfoil wheels, to give you maximum efficiency for your precise operating conditions.

Whichever "Buffalo" Fan you select as bestsuited to your operation . . . you're sure of getting the famous, rugged, dependable, longlasting construction that's been an integral part of every "Buffalo" product for more than 80 years. We call it the "Q" Factor — the built-in Quality which provides trouble-free satisfaction and long life.

For the Finest in Mechanical Draft Service, Write Us now for Bulletins FD 106, FD 205, and F 200.

## BUFFALO FORGE COMPANY BUFFALO, N. Y.

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.



VENTILATING AIR CLEANING AIR TEMPERING INDUCED DRAFT EXHAUSTING FORCED DRAFT COOLING. HEATING PRESSURE BLOWING



One of two Plants at Canajoharie, N. Y.

# BEECH-NUT LIFE SAVERS, INC.

# LIKE Frick Refrigeration

And use ten big Frick ammonia compressors, plus numerous condensers and coolers, in their famous plants at Canajoharie, N. Y.

For process work, air conditioning, and cold storage, Beech-Nut Life Savers find Frick Refrigeration an indispensable aid.

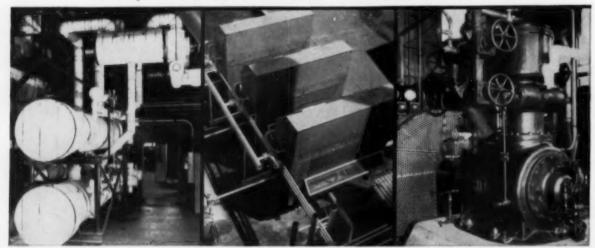
Recent installations made by Mollenberg-

Betz Machine Co., Frick Sales-Representatives at Buffalo.

Let us aid you in applying modern refrigeration and air conditioning to your business. Estimates cheerfully furnished, without obligating you.



Left to Right-WATER CHILLERS . . . CONDENSERS . . . COMPRESSORS IN BEECH-NUT PLANTS



# reduce steam trap inventory and practically eliminate maintenance

with the unique Sarco TD Thermo-Dynamic





### ONE TYPE OF STEAM TRAP FOR PRACTICALLY ALL APPLICATIONS

The Sarco TD Thermodynamic is the most versatile steam trap ever developed.

It has large capacity... but small size. Insures rapid, continuous, complete drainage of condensate at saturated steam temperature. Has high air venting capacity.

Operates perfectly on all loads , , , and when pressure fluctuates. Freeze-proof, when installed with outlet down. Highly resistant to superheat, water hammer, corrosive condensate.

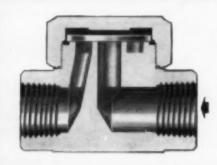


### ONE LARGE CAPACITY SEAT FOR ALL PRESSURES - 10 TO 600 PSI

Yes, in each size Sarco TD trap the same large capacity seat accommodates all pressures 10-600 psi . . . for heavy, light, or no condensate loads. Sizes 16 to 1".

Self-adjusting throughout entire pressure range . . . not a single change or adjustment required.

No need to stock seats and heads for various loads and pressures. Inventory simplified and reduced.



### TROUBLE-FREE DESIGN NO VALVE MECHANISM — ONLY 3 PARTS

Look at that cross-section, left. That's all there is to a Sarco TD! What could be simpler?

Only 3 simple, rugged parts (single pieces - not assemblies) . . . all stainless steel. Only one moving part . . . a solid hardened stainless steel disc.

No mechanism . . . the kinetic energy of steam closes the valve. No narrow channels to choke. No gaskets to leak,

Actual service experience . . . in hundreds of plants . . . under severest conditions . . . has proved that the Sarco TD PRACTICALLY ELIMINATES MAINTENANCE.

2215-8

SARCO

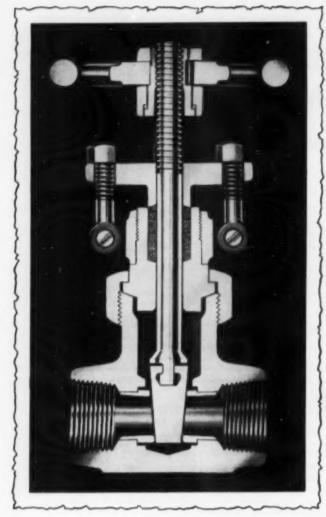


STEAM TRAP

We will gladly send you a Sarco TD steam trap and strainer for 60-day trial. No cost or obligation. You buy only if completely satisfied. Advise size—36, 1/2, 3/6 or 11"—and application. Sarco Company, Inc., 635 Madison Avenue, New York 22, N. Y.

40-DAY TRIAL CONVINCES

THE MODERN TRAP THAT IS MAKING STEAM TRAPPING HISTORY!





The Feeling is



### **CHAPMAN LIST 960**

Forged Steel Gate Valves

You want small steel valves that give the best performance and cost the least for mainte-

nance. Chapman thinks the same way and does everything possible to give you what you want.

On Chapman List 960 Forged Steel Gate Valves the wedge faces are *super* hard. They're hardened to 800 Brinell by Chapman's exclusive Malcomizing process. They can't seize. They can't gall. They're built for rugged service.

Even the long lasting seat rings are hardened stainless steel and are very easy to replace when necessary. Also, you have no full-pressure repacking difficulties with Chapman List 960 valves.

Today, there are more Chapman List 960 valves on more jobs than any other small forged steel gate valve. Valve men and Chapman see eye to eye on performance and costs. List 960's come in sizes from ½" to 2". They stand up perfectly under conditions from 380 psi at 1000°F. to 2000 psi at 100°F. Of course, for higher pressures you use Chapman List 990 valves.

With the 960's you can order Bonnet joint either gasketed or ground metal-to-metal. You can have rising stem with yoke or rising stem with inside screw. You find them all in our Catalog 10. Write today for a copy.

### The CHAPMAN

Valve Manufacturing Co.

INDIAN ORCHARD, MASSACHUSETTS

# **INDUSTRY SPEAKS**



### States Rights and Federal Subsidy

MOST OF US want the government to cease engaging in business. And most of us (especially in the South) would like minimum government control of schools, highways, health and other common needs that are identified closely with individual states.

But are we consistent?

So long as a son continues to live in his father's home, eat his father's food and sleep in his father's bed, he is (or should be) subject to his father's will. The fact that the son may hold his own job, drive his own car, and buy his own clothes does not free him from paternal restraint. Not until he moves out and provides his own home does he become an independent man.

The answer on States' Rights is just that simple. If you don't want paternal restraint, don't seek paternalistic support from the Federal Government.

We can't be independent until we remove state hands from the Federal Grab Bag. Many politicians would dislike the type of state independence we are referring to here. Many of their pet issues would evaporate. And many of their claims, "We got this appropriation for our state," would become negative in political value.

But the trend is wholesome. Many local chambers of commerce have stopped campaigning for Federal Aid on local projects. Private power companies are putting facts before the people. Some municipalities are building their own city water works. And a constitutional amendment is proposed which would remove the Federal Government from business. Top quality financial writers are illuminating the fact that a state's tax dollar loses half its value as it goes to Washington and returns to the state as a dole or subsidy.

Many large newspapers are still dominantly socialistic in promotion of Federal Aid for their pet local projects. But that is not true of all. And many of the smaller papers are becoming downright "rebellious."

Here's a quotation from a small North Carolina paper that might well be copied by the big papers:

"A proposed 23rd amendment to the Constitution of the United States, known as the Gwinn amendment, consists of one clear sentence: 'The government of the United States shall not engage in any business, professional, commercial, financial, or industrial enterprise except as specified in the Constitution.'

"The possibilities within that simple statement of principle are literally enormous.

"The government has billions upon billions of dollars invested in business enterprises of many kinds, all of which are performing functions that can and should be handled by private enterprise. These socialized businesses could be sold, and the money used to reduce the national debt, or to cut taxes, or both."

Here is another item that would be ridiculous if it were not so serious. The Public Utilities Advertising Association says in its Bulletin:

"If utility advertising were not getting through to the public so effectively, there would be no threat to stifle it. Public power politicians, both in and out of government, are making a big fuss in a plot to reduce the volume of that effective voice by a scheme of financial censorship.

"Although the bullseye is national utility advertising, the target includes individual company public relations advertising, booklets, publications and other materials. The gimmick is to disallow the cost of such material as an operating expense. The Federal Power Commission and state regulatory bodies are being pressured to knuckle under to politics and muffle the industry's voice with an accounting gag."

Progress is being made—not in Washington! Not in state capitals! But at the grass roots. People are beginning to want to run their own businesses again. They want to recognize their own obligations and pay their own debts. They want to keep more of their own money and spend it as they please in their own communities.



### **NEW USE FOR GRATING -- SUN SHADES FOR MODERN SCHOOLS**

Light aluminum grating for SUN SHADES on schools is in perfect harmony with modern school design — allows 80% passage of light and air without the accompanying penetrating rays of the sun. Because they are aluminum they are maintenance-free. Furthermore, they provide a permanent working platform for easy access to windows.

Only the finest precision manufacturing would satisfy the architect who designed the school shown here. BORDEN is recognized as a leader in quality custom-manufactured gratings, in ferrous and non-ferrous metals.

Other uses for grating in school design: Areaways, boiler rooms, laboratories, gridiron catwalks in auditoriums and gymnasiums, footscrapers and window guards.

Write for complete
information on BORDEN
All/Weld, Pressure Locked, and Riveted Floor
Gratings in this FREE 8-page catalog

### BORDEN METAL PRODUCTS CO.

853 GREEN LANE Elizabeth 2-6410 ELIZABETH, N. J.
SOUTHERN PLANT—LEEDS, ALA. — MAIN PLANT—UNION, N. J.

BORD	EN METAL PRODUCTS CO. W-S
Gentlemen:	
Please sen	d me BORDEN Catalog
NAME	
71718	
COMPANY NAME	
ST. AND NO	
CITY AND STATE	*

# **TIMELY COMMENTS**



### Survey Shows What Engineers Want and Expect

**ENGINEERS** in industry rate the high caliber of their colleagues, the opportunity for further training, and the opportunity for advancement as the most satisfying factors in their present jobs.

These are some of the findings in the newly published survey report entitled "Career Satisfactions of Professional Engineers in Industry."

The publication is the latest in a series of executive research reports made under the sponsorship of the Professional Engineers Conference Board for Industry, in co-operation with the National Society of Professional Engineers.

Conducted by the Opinion Research Corporation, the survey report is based on data gathered from interviews with several hundred professional engineers employed in industry in all the specialized technical fields. The lengthy "depth" interviews were designed to bring out the non-salary career satisfactions of engineers at three stages of professional experience — 3 to 6 years, 10 to 15 years, and 20 to 25 years.

Sixty-seven per cent of the engineers in the 3-to-6-years-experience group stated that there were things lacking in the college training they received, and approximately 76 per cent of those with more experience felt that there were deficiencies in their college training.

The engineers surveyed enthusiastically endorsed a wide range of things management can do to foster professional recognition. The engineers said management should:

Keep engineers informed Ask for their ideas on relevant matters Identify their names with their work Show how their work fits into the total picture

The survey indicated that the engineers in their company are more highly regarded than those in the accounting, personnel, public relations, and advertising branches. However, appreciable numbers feel that the engineer is accorded less importance than the production and sales departments. Well over half the engineers in all experience-level groups think that engineering is not recognized as a profession by the general public.

The survey found that the engineer feels deficient in the non-technical skills, and welcomes company training that will extend his competence beyond the purely technical.

Topping the list of company sponsored training courses that the engineers said would be most profitable to them were: organization and planning, how to supervise, and how to handle people.

The survey found that the engineer doesn't have a very strong bent for engaging in the activities of professional societies. He doesn't see the need for such activity on his part, and doesn't view it as status building. Only 10 per cent of the engineers surveyed said they are "very active" in professional engineering societies. Seventeen per cent said they are "fairly active"; and the rest said they "do little or nothing in professional societies."

The survey also found that the most skepticism about the opportunities for advancement in engineering was expressed by men in the lowest technical jobs.

Six out of ten of the engineers survey reported that they have not held a full-time job with any company other than their present employer. Only one in five has experience with as many as two other employers.

Copies of "Career Satisfactions of Professional Engineers in Industry" may be obtained for \$3 from the Professional Engineers' Conference Board for Industry, 2029 K Street, Northwest, Washington 6, D. C.





Memphis, Tennessee . . .

# **PALLETIZE**

### and Let Fork Trucks Take Over

Bundles of hardwood flooring are stacked 3 wide and 4 high. Conveyor leads to Signode power strapping machine. Straps are applied automatically at the push of a button.

"BE WISE -- PALLETIZE!" That

is the slogan adopted by Memphis Hardwood Flooring Company, Memphis, Tennessee, according to Mr. Ray F. Sharp, Manager.

Memphis Hardwood Flooring Company, one of the country's leading producers of hardwood flooring, palletizes all of their flooring production, with the exception of local deliveries.

Several years ago they took a look into the future, and decided to unitize their entire production of flooring. They built a large new warehouse to facilitate this type of operation. Now, after the individual bundles are made up into 1,000 ft packages, lift trucks take over by either taking these packages to the storage area or by loading the cars direct.

#### Former Methods

The individual bundles were formerly tied with hand strapping tools. The elimination of several men by adopting the Signode Power Strapping Machine came a couple of years before they started palletizing but is mentioned here since it is an integral part of their whole operation. The elimination of this labor through use of the strapping machine, is not taken into account in the following comparison of present and former method.

Before they started palletizing, each of the three units had one man operating the strapping machine. Further, each unit had one take-off man that took the tied bundles of flooring and put them on warehouse trucks. Four men worked these trucks to storage and placed the bundles in storage according to grade. Shipping out approximately three cars per day involved using seven men, which made their tying, warehousing, and shipping operation use a total of 17 men.

#### **Enter Automation**

Each of the individual unit conveyors now ties into a central warehouse conveyor. The pieces of flooring are made up into bundles by the rack pullers, flow down the unit conveyor to the power strapping machine, are tied, and flow directly to the central warehouse conveyor. The three take-off men are now eliminated. The warehouse conveyor runs down





Conveyors move strapped bundles to sorting table where they are graded and palletized.





Signode Steel Strapping Company strapping machine and strap dispenser are used to bundle flooring into pallet for lift truck handling. Palletized flooring is then strapped in boxcar for damage-free shipment.

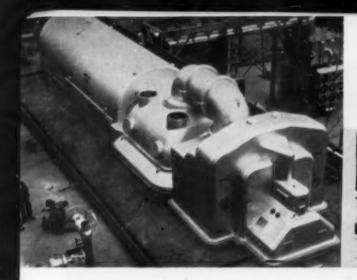
the middle of their former warehouse. The bundles of flooring are taken off from each side and pallet make-up is started. At this point, the four truckers to warehouse storage are eliminated. Adding to this, the three take-off men mentioned above, a total of seven men have now been eliminated.

However, it takes six men to take-off the warehouse conveyor, build up the pallets and make an accurate tally card. In addition, one man straps the packages to make up the 1,000 ft units, so that the same number of men are needed as before.

Memphis Hardwood cuts back their flooring, so that no piece is over 12 ft long. They have made up special jigs in which to palletize; out of every 28 packages of approximately 1,000 ft, they have seven 12 ft and twenty-one 8 ft packages.

Here is how their tally system works. The man making up the pallets tallies each bundle that goes into it, and of course the total bd/ft count is on each pallet when it is completed. The tally sheet consists of an original and two carbon copies. When the palletized flooring is shipped out, two copies of the tally go to the main office and one stays right on the pallet for the receivers record. One of the two copies kept, is for Memphis Hardwood's records and the other is sent to their customer

(Continued on page 56)



Outdoor units with and without turbine walkin enclosures. The exciter enclosure on each of these units is standard.



# Walk-In Enclosures for Outdoor Turbines

By E. G. NOYES

Land Turbine Engineering Steam Division Westinghouse Electric Corporation

DEMAND of maintaining power installation cost at a minimum has led to the partial elimination of expensive building structures for many power plants in the South. This placed upon the power equipment manufacturer the responsibility of furnishing a product designed to operate trouble free when exposed to weather.

Initially, outdoor turbine-generator units were installed with no personnel protection at the exciter. The turbines were weather-proofed by providing a heavily reinforced sheet steel lagging which completely covered the insulated portion of the turbine cylinders, the governor end pedestal and turbine glands. With this arrangement the equipment was completely protected, but the operators were exposed when manual adjustments were required at the exciter.

This was considered by some to be a major disadvantage which led to the development of "walk-in" enclosures over the exciter (above left) and the governor end of the turbine (above right). The exciter enclosure has been supplied and considered standard equipment for most outdoor installations. Turbine enclosures can be supplied if conditions warrant the higher investment.

### Florida Installation

One of the latest outdoor installations equipped with a turbine walk-in enclosure is the No. 5 unit at the Cutler Station of the Florida Power and Light Company (see photograph). This enclosure is typical of that being supplied on other modern outdoor units where this additional feature is required.

The turbine enclosure is a weatherproof rectangular reinforced sheet steel structure which attaches to the main turbine lagging and extends several feet forward of the governor end pedestal. Located within the enclosed space are the control hand wheels of the throttle valves and, for reheat turbine installations, interceptor valves.

To provide the operators sufficient instrumentation and controls, a separate start-up panel is positioned conveniently within the enclosure. To maintain ambient conditions in the confined space at a reasonable comfort level a forced air ventilation system is an integral part of the enclosure design.

Physically, the enclosure consists of several transverse structural bents with interconnecting members and sheet steel plate. This forms a rigid structure capable of withstanding substantial wind and snow loading. The frame is designed to include a separate hatch which, when removed, permits crane access to the governor end pedestal without materially affecting the rigidity of the main structure. All permanent joints of the structure are seal welded and gasketed joints are provided between assembly components.

The enclosure and the main turbine lagging rest on a foundation curb which is elevated several inches above the main turbine generator deck level. This curb provides a natural dam to the ingress of water in the enclosed space.

The lagging and enclosure are bolted to foundation anchor strips located at the outer edge of the curb. A rubber gasket is positioned between the anchor strip and the base of the structures to form a watertight joint. A separate start-up panel located within the enclosure mounts the necessary instrumentation to observe the operation of the turbine during the starting period and also provides a convenient check point at the turbine during normal continuous load operation. These instruments and controls include:

- 1. Steam and operating oil gauges
- Control valves, gauges, and thermometers for establishing proper sealing of the turbine glands
- Control switches and signal lights for the auxiliary oil pump, vapor extractor and enclosure ventilating fan motors
- 4. Position indicating lights for

throttle valves, interceptor valves, reheat stop valves, and turning gear

Electric speed indicator or recorder.

The panel can be enlarged or a separate panel provided to mount the full complement of standard turbine supervisory instruments.

Experience obtained on early turbine enclosure installations proved that a properly designed ventilation system is essential to maintain reasonable value. The ventilating unit for modern outdoor turbine enclosures consists of a centrifugal blower, filters, mixing section, and space for heating elements.

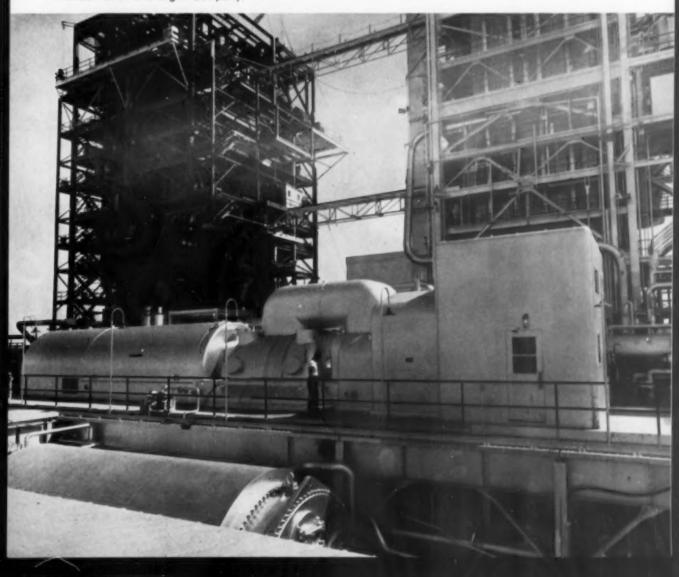
The air supply is taken from the

outside through louvers located in the front wall of the enclosure. The fan discharges horizontally above personnel level, thus pressurizing the enclosed space. Air is discharged from the enclosure near the floor line through a double wall section between the enclosed space and the turbine. It is discharged to the outside through louvers near the top of the structure. Under normal conditions this ventilating system is designed to maintain the temperature within 10 degrees F of ambient.

In general little trouble has been experienced with the design of turbine walk-in enclosures. The one

(Continued on page 56)

Florida installation provided with a turbine walk-in enclosure. This is unit No. 5 at the Cutler Station of Florida Power and Light Company.



# WASTE DISPOSAL With Drag Scraper



of a lime-like sludge is disposed of by a Sauerman Tautline DragScraper machine at the Foote Mineral Company's plant at Sun-

DragScraper machine at the Foote Mineral Company's plant at Sunbright, Virginia. The sludge, a byproduct of their lithium ore processing, is delivered by an overhead belt conveyor to an initial pile at the edge of the disposal

The disposal of the waste product is ideally suited to the Sauerman Method. Only the Crescent DragScraper and haulage cables enter the disposal area. The 2-yd DragScraper distributes the sludge from the conveyor discharge point to a natural valley about 1,000 ft in length and several hundred feet wide. Proper elevation for the long span is supplied by a 35 ft structural steel stiff-leg head-post and two 40 ft tubular steel guyed tail masts. Fairlead blocks mounted on the headpost provide cable leads to the operating area and back to the hoist. The two masts are used as tail anchorages for the track cable and guide blocks. These masts are set about 200 ft apart.

The DragScraper is connected to a 2 wheeled plate carrier which runs on a pretensioned track cable between the headpost and one of the guyed tail masts. The use of a track cable provides excellent travel control of the DragScraper on this long span. On the carrier are two beckets for the conveying cable and two running sheaves

ABOVE VIEW looks toward the disposal area. Tail mast is in background, Sauerman Drag-Scraper, belt conveyor and initial pile are in foreground. Dike at right helps contain waste material.

Hoist at left is operated by extended reach rods and air-controlled valves from the elevated operator's station. Cables are reeved from hoist through fairleads mounted on stiff-leg headpost to the carrier, DragScraper and tail post. Conveyor above headpost delivers waste to initial plan. through which the DragScraper hoisting line is reeved. This ability to hoist the DragScraper free of the material is of great advantage over conventional hauling methods.

A Sauerman three-drum hoist driven by a 75 hp reversible electric motor provides DragScraper power. Brakes are operated by extended reach rods from the elevated operator's station. The hoist clutches are air-actuated by control valves which are also located in the station. No men or machinery are required to travel on the sludge.

When stocking out, the Drag-Scraper travels at 250 fpm. After it is lifted free of the load, the Drag-Scraper is backhauled to the pile at over 700 fpm. The 2-yd machine can handle about 100 tons of sludge per hour on an average haul of 230 ft. When material is conveyed to the extreme limits of the disposal area, this tonnage decreases but is still ample to keep up with plant production.

The DragScraper stocks out in

One of the 40 ft tubular steel guyed masts. Plant is in far background.

a straight line toward one tail mast until a high pile is formed. The guide blocks are then transferred to another mast which provides another line of operation. Transfer of blocks and lines are necessary at about six months intervals. The use of a third tail post allows plant personnel to locate the post in position for the next line of operation. With this third post fully guyed in place, it reduces considerably the operation down time they would experience if one of the posts in use had to be moved.

By relocating the operating cables on the circumference of the basin, the entire area may be covered by the DragScraper. The topography of the land lends itself very well to Foote Mineral's waste disposal problem. The basin is a naturally formed bowl with about a 30° slope. Surrounding hills are



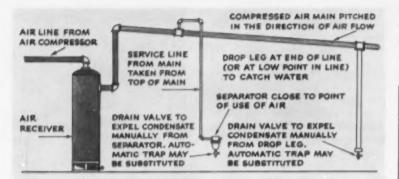
as high as 100 ft above the floor and the lowest bank is about 40 ft.

DragScraper is stocking out. Note soupiness of material when it first drops off belt. The waste gradually dries and finally hardens. Material resembles a slow setting, low slump, cement mixture. PHOTO AT RIGHT shows headpost and operating cables.





SOUTHERN POWER & INDUSTRY for NOVEMBER, 1957



Proper piping and drainage can furnish reasonably dry air without cooling, for less critical installations.

BUT -

Where completely dry air is needed an aftercooler between the compressor and the receiver causes water to fall out in the receiver, leaving less for the separator to remove.

# How Dry Is Your Air?

WATER can be eliminated from

air lines in several ways. In all cases, correct piping and draining will help. Where this alone is not adequate, after-coolers can be employed to condense the water before the air is distributed. And, for unusual applications where cooling water is not available, or where air lines must pass outdoors through freezing temperatures, special desiccant dryers may be used. The first two methods are used in the majority of installations, so they will be discussed in detail here.

### Piping and Drains

Correct piping and draining will often provide reasonably dry air at the point of use. Even though additional drying methods are used, attention to installation details will help to provide air that is satisfactory.

One of the simplest and most effective ways to decrease air contamination and increase compressor efficiency is to locate the compressor intake carefully. For efficiency, the intake should preferably be outside the building, on the coolest side. Because this cool outside air is more dense than indoor air, a greater quantity of air will be delivered to the compressor.

### By A. M. GUSTAFSON

Chief Engineer Schram, Inc.

For example, if the outside air temperature averages 40 F and the indoor temperature is 70 F, only 943 cu ft of outdoor air will be needed to deliver the same weight as 1000 cu ft of indoor air — a direct saving of nearly 6%. The greater the differential between outdoor and indoor temperatures, the greater will be the economy.

Care must be taken, however, to avoid locating the intake near steam or air exhaust vents, which would add moisture to the air. The location should also be free of fine industrial dusts or pigments or any other source of contamination. Avoid sulfurous or chlorine-contaminated atmospheres — these substances mix with moisture to produce weak acids, which will attack screens, tools, and piping.

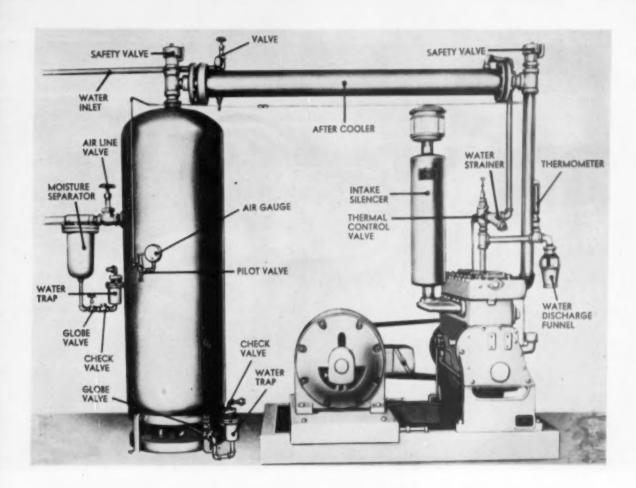
If the receiver is the vertical type, air should enter at the top, so that moisture can fall directly to the bottom, where it will collect. The outlet from the receiver should be in the shell, near the top. A drain must be installed in the bottom of the receiver, and

should be opened daily to remove all accumulated water. If automatic drainage is desired, an automatic trap can be used preferably of the inverted bucket type.

A similar arrangement should be used with horizontal receivers. The entrance should be at the head; the outlet should be in the shell, on the top side near the head. A bottom drain is also required.

Air lines must be large enough to handle demands from machines and services without excessive pressure drop (see Table I). These lines should be slightly pitched so that any moisture that condenses will flow in the same direction as the compressed air. At the end of the line, or at a low point in the line, a drop leg should be installed to collect condensate. Either a hand valve or an automatic trap can be used to drain this leg.

Service lines for tools or services should be taken from the top of the main. Although this arrangement usually requires the use of two elbows, it will guarantee that air taken from the main will be dry. Any condensate in the main will flow by on the bottom. Use a check valve wherever there is any chance of



liquids backing into the system from other sources, such as in air-purging systems. To remove any remaining water from the air before use, a moisture separator is usually installed in the service line immediately ahead of the point of use. The air will then be practically dry.

### Lower Dewpoint

Completely dry air can be obtained by reducing the dewpoint of the air — before distribution — to a value lower than the lowest temperature that the air will encounter in any part of the system.

Dewpoint can be defined as the compressed-air temperature below which water vapor begins to condense. If air is cooled below this temperature, water will be precipitated, and the dewpoint will stay at the lowest temperature to which the air has been subjected, provided that all of the

released water has been trapped out. This water must be removed, or it will vaporize again and raise the dewpoint.

#### Aftercooler

An aftercooler can be used for

dewpoint reduction. It consists of a nest of tubes in a shell. Compressed air is passed through the tubes and cold water is circulated over and around them. Aftercoolers may be mounted either verti-(Continued on page 103)

TABLE 1 — Pipe Diameter (in inches) Required to Pass a Given Amount of Air at 100-lb Gage Pressure with Less than 1 lb Drop in Pressure.

Cu ft Free Air Per Min	Length of Pipe in Feet										
	50	100	200	300	400	500	750	1,000	2,000	3,000	5,000
20 40 60 80 100 125 150 175 200 250 300 400 500 600 800 1,000	\$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	1 1 1 1 1 1 1 1 1 2 2 2 2 2 2 2 2 2 2 3 3 3 3	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 1/2 2 2 2 1/2 2 1/2 2 1/2 3 3 3 1/2 4 5 5	1 1/4 2 2 1/2 2 1/2 3 3 3 1/2 4 5 5 5 6	1 1/4 2 2 1/2 2 1/2 3 3 3 1/2 4 4 5 5 5 6 6	1½ 2½ 2½ 3 3 3½ 4 5 5 6 6 8



Fluorescent lamps permit high levels of uniform illumination throughout this North Carolina mill.

# **GOOD LIGHTING** a Tool for Production

PART 4 — Fluorescent Lamps

By ROY A. PALMER

Duke Power Company

Charlotte, North Carolina

OVER 10.000 different types of lamps are manufactured today, a considerable number intended for general illumination and many others for special applications. It is obviously important that the right lamp for the lighting job at hand be selected in order that proper and adequate illumination be provided and that the greatest economy in lamp cost and operation may be assured.

While the industrial executive cannot be expected to be a lamp expert, his understanding of principal features of lamps will be helpful. Keeping in mind that lighting is a tool of production emphasizes further the need for judicious selection of lamps for the job. Fluorescent lamps are discussed here, and incandescent lamps will be covered in the next installment.

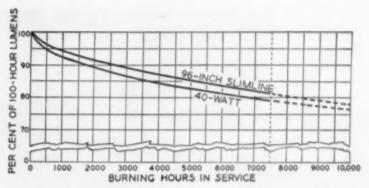
While the fluorescent lamp was introduced as recently as 1938, it has become a standard source of illumination for general lighting. The several advantages of this lamp are responsible for its popularity. It produces more light per watt of current than incandescent lamps, it has less radiant heat, and has a longer life.

The fluorescent lamp consists of a glass tube with tungsten filament electrodes sealed in each end which are coated with compounds of strontium, barium or calcium oxides. A small drop of mercury and a small amount of argon or krypton gas are present. A thin coating of white powder called "phosphor" covers the interior surface of the tube. When a proper voltage is impressed across the electrodes the exide coating facilitates the flow of current from one electrode to the other.

The electricity passing through the mercury vapor generates a very small quantity of visible bluegreen light. But more important, it produces considerable invisible ultra-violet radiation which has the property of activating the phosphor coating and causing it to glow or fluoresce. This fluorescence produces the useful light.

Many phosphors are available, each of which glows in a different color when excited by ultra-violet radiation. By combining different colors in proper proportion, various shades or tints of "white" light can be obtained. There are upwards of a dozen white lamps listed in lamp manufacturers' catalogs.

There are four designated colors of white lamps which are most generally used: Standard Cool



Light output of fluorescent lamps may depreciate as much as 20 to 30% by the end of rated life.

White and Standard Warm White, Deluxe Cool White and Deluxe Warm White. Daylight is another designation for a lamp which produces a blue-white light similar to daylight. While we consider daylight as quite ideal illumination, we have evolved through the ages under a warmer tint of light for indoor areas. Therefore, the use of Daylight lamps creates an atmosphere that is cold and not too pleasant for some, particularly women. This is perhaps due to the fact that there is less red light in this lamp to accentuate the red in lips and cheeks and the complexion becomes rather sallow.

Standard Cool White lamps are

generally most satisfactory for industrial installations. These lamps are efficient and provide satisfactory color rendition for viewing most products as well as for worker's complexions.

#### Ballasts

Since a fluorescent lamp is essentially an arc lamp, it is necessary to control the current by a limiting device or ballast which is a specially designed auto-transformer. Individual ballasts are available for single, two-, three-and four-lamp operation. They are usually contained in the fixture housing the lamps.

Because the cores of ballasts are

High level illumination is provided by phosphor reflector lamps shielded by metal reflectors which allow upward light to illuminate the ceiling which is painted flat white in this metal products plant.



Right — The Power-Groove Lamp has identations which not only increase area of the phosphor but minimize distance which radiation must travel to reach it.



Left — A Fluorescent Lamp with a built-in reflector punches light downward.

built up of iron laminations, vibrations are sometimes set up by the alternating magnetic field causing a perceptible hum. Good ballasts are so constructed as to minimize hum. Where even a small hum might be objectionable, ballasts are available which are rated for low noise level. The mounting of the ballast can control the noise to a considerable extent as can the resonant qualities of the fixture, ceiling or walls of the room.

#### Starters

Early fluorescent lamps as well as many today, use a starter to heat the electrodes to facilitate starting at low voltage. Most lamps installed in industrial plants today use Rapid Start or Slimline lamps which do not require a starter.

### Life

Fluorescent lamps do not have a filament to "burn out" as in an incandescent lamp. The oxide coating on the electrodes of the fluorescent lamp largely determine its life. Each time the lamp is turned on, a small quantity of this oxide is sputtered off. When the material has been dissipated, the lamp will no longer operate. Therefore, fluorescent lamps will last longer when burned continuously rather than when frequently turned "off" and "on." The rated life of most fluorescent lamps is 7500 hours burning when operated on the average for normal periods of 4 hours or

Life ratings of lamps are average

life of a group of lamps. In this respect lamps are somewhat like human beings. Our average rated life may be three score and ten, but some people die much earlier, others live much longer. Similarly, lamps may burn out before their average rated life but some burn longer. Their average life is 7500 hours.

Thus some lamps may burn as long as 12,000 hours or more but in industrial plants where they are burned 12 to 16 hours a day, lamps which last that long may be depreciated in efficiency. The reason for buying lamps is to provide light. Therefore, when long-burning lamps become low in light output they should be replaced. The diagram shows how light output depreciates with burning hours.

#### **New Developments**

There are improvements constantly being made in the items which make up the lamp: brighter, more efficient phosphors, improved cathodes, new circuits, tubes, etc.

Manufacturers now have a line of High Output lamps which are high in efficiency — 70 lumens per watt. While most fluorescent lamps will have difficulty in starting in low temperature, the High Output lamp will start as low as — 20 F. It is, therefore, well suited for outdoor locations or where there are low temperature drafts.

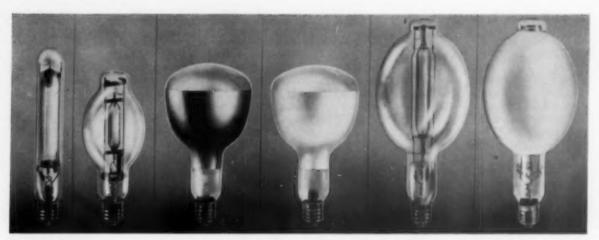
Another lamp recently on the market is called Power Groove lamp. This lamp is high in wattage, 107 to 200 watts and has a light output from 54 to 70 lumens per watt depending on the length of the lamp. The lamp tube has several depressions along its length from which it derives its name. These depressions or grooves shorten the distance that the ultra-violet energy must travel to reach the phosphor coating, thus raising the efficiency.

Still another fluorescent lamp is available with an internal white reflector coating between the phosphor and the glass which directs some of the light downward, thus increasing the light in that direction.

#### Shields

Since fluorescent lamps are long in length, their brightness is relatively low. Nevertheless, in most installations, bare lamps are not desirable. They should be used in fixtures which adequately shield the lamps from normal view. It is axiomatic that exposed lamps anywhere in a plant hinder vision while well shielded lamps provide illumination for seeing. As these lamps continue to improve in light output, their brightness will increase, meaning that the fixtures for them, must be well designed to assure quality illumination.

Fluorescent lamps permit high levels of illumination at high efficiency thus providing low cost of light. The plant executive can now take advantage of high illumination levels to improve production, reduce costs, minimize accidents and keep morale high.



A family of mercury lamps. The third from left has a built-in silver reflector. The fourth lamp has a phosphor reflector to direct the light and improve its color. Lamp No. 6 is completely phosphor coated for color improvement.

### Mercury Lamps

Through the years, scientists have searched for practical, new light sources which produce more light for the current consumed. The fluorescent lamp uses a mercury arc. Previous use of the mercury arc to produce light was the Cooper Hewitt lamp. Employing low pressure mercury gas, it produced a blue-green light, relatively economical in its day. The lack of red light distorted color rendition and many objected to the sallow appearance of fellow workers under its illumination.

High pressure mercury arcs of today are more efficient than the old-type low pressure lamps and tungsten filament lamps. There is also some improvement in the color of light emitted. Some mercury lamps are coated on the interior of the glass bulb with phosphors similar to those used in fluorescent lamps thus further improving the whiteness of the light.

There are several types of mercury lamps available for industrial illumination ranging from 100 to 3000 watts, and in a variety of shapes to suit the technical requirements of lamp construction and the purposes for which it is used. All of these lamps have essentially the same construction, except the 3000 watt lamp. A quartz tube which houses the arc, is sealed within an outer bulb. As with all arc-type lamps a ballast

is necessary to regulate the voltage and current.

When mercury lamps are first turned on, it takes 5 to 8 minutes for them to reach full light output. Should the current be interrupted, they must cool for a period of 5 to 7 minutes before they will restart. To overcome this characteristic some installations include tungsten filament lamps which not only re-start the moment current is restored, but also provide the deficiency in red, thus creating a favorable "white" light as well as adding more illumination on the work.

All mercury lamps should be used with reflectors, not only to properly direct and shield the bright light from the interior quartz tube, but to protect the lamp from mechanical injury.

The high light output and the small area of the quartz tube in these lamps create considerable brightness. Therefore, these lamps are best suited for high bay lighting. Generally, mounting heights should not be less than 15 ft unless very specially engineered. There is a reflector on the market which is so designed that it permits mounting as low as 12 ft. Usually, higher mounting is desirable. These lamps are ideally suited for installations from 25 to 40 ft high.

For dusty interiors, a mercury lamp having a "reflector" type outside bulb which has an interior silver coating keeps illumination level high. The silver coating reflects light downward, most of which might otherwise be absorbed by collection of dust on the upper surfaces of the bulb. This lamp should also be used in a reflector housing to eliminate breakage.

### Mercury Types

The RC-1 lamp is a reflectortype lamp having a phosphor coating on the interior. The visible light from the mercury vapor are is greenish-blue in color as in all mercury lamps. The deficiency in red is supplied by the phosphor which fluoresces red under the excitation of the invisible ultra-violet radiation. Thus while providing a good reflector, the phosphor improves the color so that a good "white" light is obtained.

There are several types of semireflector mercury lamps available for use in work areas where colorimproved light is important. While the light output is slightly decreased over the non-coated type, the improvement in color overcomes this slight disadvantage. Some lamps are available having hard glass bulbs which resist breakage from thermal shock, fumes, moisture or flying insects.

The 100-watt mercury lamp is not generally used for illuminating broad areas, but rather for local lighting or specialized application. The 400- and 1000-watt lamps are

(Continued on page 56)

### **Lighting (Continued)**

the popular sizes for general lighting.

The 3000-watt lamp consists of a tube 55 in. long and 1¼ in. in diameter. It emits 132,000 lumens. It is applicable exclusively to highbay installations where the lamps can be mounted 35 ft or more above the floor. Because of this mounting height and the high lumen output, the lamps can be spaced further apart, fewer units being required.

All mercury lamps have inherently long life, but like fluorescent lamps, their life is related to burning hours per start. Their rated average life is 6000 hours if they are not turned off and restarted more often than once every 5 burning hours. Longer burning hours may increase their life over their average rated life. It should be noted that this rating is on the basis of a group of lamps, not individual lamps.

### Uses

The past few years have witnessed a great increase in the popularity of mercury lamps for illumination in industrial plants. Their efficiency and long life are no doubt largely responsible. Credit must also be given the im-

provements which have been made including the use of color improvement through the use of red fluorescing phosphor. Their increased use for street lighting perhaps has influenced greater use in industry.

High bays present some problems in relamping and cleaning of fixtures. The fact that one lamp of high efficiency can be more easily reached and handled than several can influence decisions in its favor. As time goes on, indications are that further improvements in efficiency and cost may be expected. Even at its present state, the mercury lamp is rendering a valuable contribution to providing high illumination at lower cost.

### Palletize (Continued from page 45)

with the invoice.

Note that if a company formerly had a tally man for each unit, he would be eliminated since the men making up the pallets now do this. Further, inventory taking is made very easy since each package containing approximately 1,000 ft has the exact footage right on it.

The pallets are now all made up ready to be moved to storage or shipment. The entire operation from this point on is done with only four men, whereas they formerly used seven in loading three cars per day. Two lift truck drivers are used and two men prepare the car for strapping. The lift truck drivers take the pallets from where they are made up to storage, taking some direct to a car being loaded, or taking pallets from storage to car. The other two men's work consists of preparing the car for the Signode system of bracing, making up the wooden gates and finishing strapping the car after all pallets are loaded.

Material cost to palletize one car of flooring, including all strapping and lumber cost is approximately \$21.00, or about \$0.87½ per M, for a carload containing 24,000 bd/ft. Elimination of three men as mentioned above, shipping three cars per day, shows an elimination of one man per car. Converted into terms of cost per M/bd/ft this man was worth approximately

\$0.39 per M on just his basic wage scale. Not taking into consideration the overhead cost of a man in a strict cost accounting procedure, Memphis Hardwood now finds that their total cost to palletize is \$.87½M minus \$.39M or \$.48½M.

Their customers of course can

unload palletized flooring in a fraction of the time required for unloading individual bundles. They can move into their warehouse and load out-going trucks in minutes now instead of hours. It has been reported that a flooring wholesaler can save as much as \$3.00 to \$5.00 per M, by receiving palletized flooring.

### Walk-In Enclosures (Continued from page 47)

exception to this was an ineffective ventilating system on initial installations. However, this condition was corrected by the manufacturer in the field.

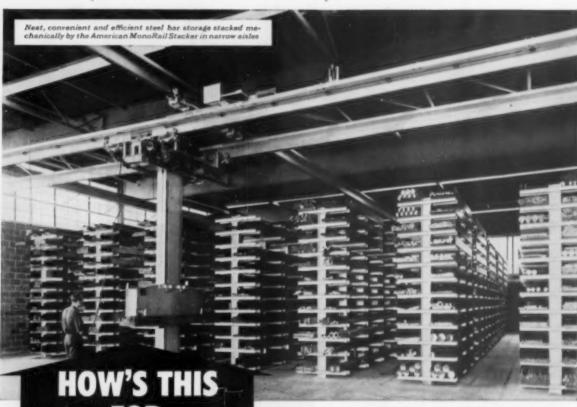
Turbine walk-in enclosures are relatively inexpensive considering first cost and maintenance. The initial investment for an average size turbine-generator unit is increased less than 1.0 percent by the addition of the turbine walk-in enclosure. Maintenance presents no particular problem. Regular painting of all exposed surfaces is an expected requirement as well as renewing gaskets when necessary between main enclosure parts.

#### Objections

There have been objections raised to the turbine walk-in enclosure principle. Some utilities consider that they outweigh any of the apparent advantages. These objections are:

- Laydown space for the enclosure is required during a major overhaul or inspection.
- Forced ventilation requirements are high and adequate air filters are necessary to maintain cleanliness.
- The exposure to fire and accidents is much the same as that existing in completely enclosed stations.
- In general, turbine operators acquainted with outdoor installations prefer the complete outdoor design.

Individual preference and requirements will, in many cases as in the past, determine the outdoor arrangement required for any particular installation. In areas of extreme weather or where hurricanes are a design consideration turbine walk-in enclosures deserve consideration.



American MonoRail engineers, working with Hawkridge Brothers Company, designed this system for storing bars, rods and other long steel shapes.

**STEEL STORAGE!** 

Note the extremely narrow aisles and maximum height of racks. Bars and rods, 20-22 feet long, are placed in pans 18 feet long. The American MonoRail Stacker transfers these pans to either side of an aisle for storage.

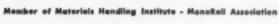


MonoRail Stacker forks sup-port bar in saw Saw with extension rolls to any con-venient spot in the ware-



American MonoRail Stacker lowers a banded bundle of bars over prongs which in-geniously splits bands, lets bars roll into trough for pick-up in a tray

Photos: Courtesy of Hawk-tidge Brothers Company, Waterbury, Conn.





**AMERICAN** 

COMPANY



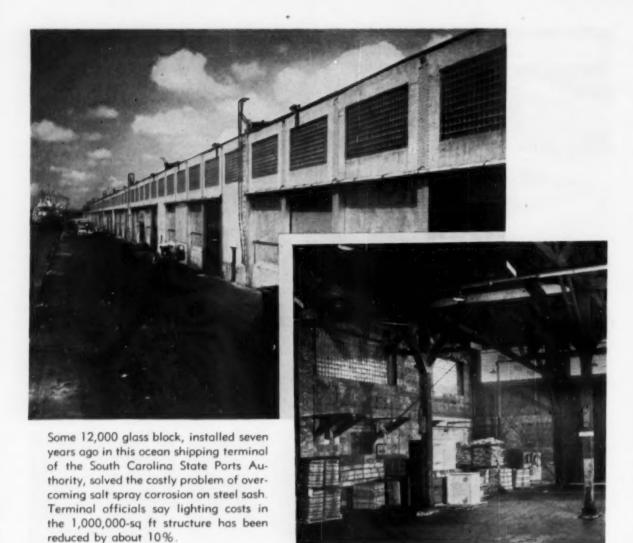


STACKER CRANE



13105 ATHENS AVENUE, CLEVELAND 7, OHIO (IN CANADA—CANADIAN MONORAIL CO., LTD., GALT, ONT.) MANUAL MONORAIL

For more information, use Reply Card-Page 89



### **CORROSION STOPPED**

A GLASS BLOCK installation in an ocean shipping terminal has solved the problem of damaging salt spray corrosion of steel sash, and has cut lighting costs by ap-

proximately 10%

Located at North Charleston, S. C. and owned by the South Carolina State Ports Authority, the cargo terminal was given a new lease on life seven years ago when some 5300 sq ft of rusted steel sash windows were replaced with Pittsburgh Corning glass block.

Erected in 1917 to serve as a

point of embarkation for U. S. troops in World War I, and completely renovated to serve the same purpose in 1941, the terminal was taken over by the Ports Authority of South Carolina in 1947. In 1951 glass block were installed.

Since the 8-in. glass block were mortared into place in 14% by 6%-ft panels to become an integral part of the terminal walls, leakage of salt spray and rain has been completely eliminated. Window maintenance has been reduced to the occasional replacement of a

shattered block. On no occasion, according to terminal officials, have both faces of a block been broken, necessitating immediate repairs. Paint and putty are no longer required.

The glass block panels were installed along the front or dockside of the terminal, and along the north side adjacent to a paper and pulp mill. Light entering the warehouse through these panels is evenly distributed, resulting in an estimated 10% drop in lighting costs.

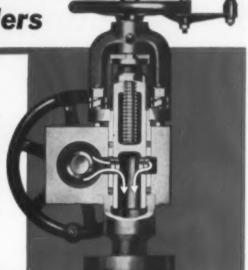
The terminal with four berths, has more than 1,000,000 sq ft of floor space. Headhouses for assembling cargo total 154,000 sq ft, with 48 continuous sections of 16,000 sq ft each, for warehousing.

# UNIT TANDEM

<u>rugged</u> blow-off valves for <u>high pressure</u> boilers

### HARD-SEAT-SEATLESS COMBINATION

■ For boilers up to 1500 psi, this Yarway Unit Tandem Blow-Off Valve offers the maximum in dependable service. A one-piece forged steel block serves as the common body for the Yarway Stellite Hard-seat blowing valve and the Yarway Seatless sealing valve. All interconnecting flanges, bolts and gaskets are eliminated. The Unit Tandem at right is sectioned through Seatless Valve to show balanced sliding plunger in open position and free flow.



### HARD-SEAT-HARD-SEAT COMBINATION

■ For boilers to 2500 psi, this is the valve to use—Yarway's Unit Tandem Hard-seat—Hard-seat combination. Disc has welded-in stellite facing and inlet nozzle has integral welded-in heavy stellite seat, providing smooth, hard-wearing surface.

OVER 4 OUT OF 5
HIGH PRESSURE PLANTS
USE YARWAY BLOW-OFF VALVES

Write for Yarway Catalog B-434

#### YARNALL-WARING COMPANY

Home Office:

116 Mermaid Avenue, Philadelphia 18, Pa. Southern Representative:
ROGER A. MARTIN, Bona Allen Building, Atlanta 3, Ga.



**BLOW-OFF VALVES** 



BIRMINGHAM employees of National Woodworks, Inc., earn as much as 30% over their base wage scale.

### Alabama Woodworking Plant

# This Incentive Plan Pays

PLANTS do not have to be big in order to make incentive plans pay off.

Proof is the success of the plan in operation at National Woodworks, Inc., in Birmingham, Ala., where the plant employs an average of 50 men. This firm manufactures window units, door units, trim, and other wood items.

In the past three years, National has been able to increase productivity per men from an average of 65% of standard to approximately 115% — and still maintain high-quality.

This comes about partially through a complete incentive pay plan that enables the firm's production workers to earn as much as 30% over their base contract scale. The workers like the plan.

In spite of three increases in labor rates during the past three years, this company has avoided raising prices. To bring this industrial achievement into being, National took five major steps: (1) establishment of an incentive pay plan for all production workers; (2) complete modernization of production facilities; (3) standardization of products and design; (4) simplicity and uniformity of work flow, and (5) automation — at least to a degree.

All employees in the machine and assembly departments are on the incentive pay plan. Superintendent Ralph Weed and his staff now are developing an incentive plan for the service department. Its six to eight men move materials to and from machines, and deliver material to the various departments, by means of fork-lift trucks and electric transporters.

Once a new product has been developed or re-designed, a mockup is presented first to President Charles L. Bromberg, Block, and the administrative staff, so they can see how it fits into the production and sales plans.

If an "O.K." is received from management, the product is then submitted to the sales department. If the sales department agrees the product can be sold, it is then detailed and engineered into the plant by Terrell Bridges, the plant engineer. An initial production run is set up.

While the production run is in process (usually for about eight weeks), time-and-motion studies as well as methods and machines are studied to develop the most economical means of production. After these studies have been made and production methods have been ironed out, the various operations are rated and incentive pay points are established.

Two kinds of work are done in the plant. One is to supply standard items listed as stock units in the company's catalogs. The second is to fill special orders. Therefore, this firm actually performs two separate functions in production.

Each production worker keeps a daily time ticket of the job performances and quantities that he (Continued on Page 103)

# **C-V NEWS NOTES**





# New regulator valve delivers on more jobs

Designed for remote control service, the Copes-Vulcan diaphragm actuated valve handles water, steam, air, gas, oil and other similar fluids with new efficiency. This valve has been engineered and precision-built for those operations requiring superior accuracy and sure dependability.

The Type-CV-D Valve may be direct or reverse acting. It has excellent rangeability and serves a broad variety of applications in sizes up to 12 inch.

Optional features include: cooling fins and stuffing-box lubricator to maintain low friction over longer packing life . . . auto-lock . . . top or side-mounted hand wheel for emergency operation.

To assure trouble-free performance, Copes-Vulcan customdesigns each valve to suit your most exact control requirements. Write for Bulletin 1027.



# Desuperheater developed to increase control

Based on a new steam-assist principle, this Copes-Vulcan Desuperheater permits close control of final steam temperature for processing work or auxiliaries. Using assisting steam only on lighter loads, it decreases the amount as the load increases. Exclusive swirl-chamber intimately mixes cooling water with steam. Inline type also available. Write for Bulletin 1024.

# On-the-job report on boiler control

How Copes-Vulcan helps make more power for Carolina Power and Light Company is covered in this factual report on the Louis V. Sutton plant. Highlights include: Combustion, feed water, boiler feed pump re-circulation controls plus automaticmequential soot blowing. Write for Bulletin 1032.





# COPES-VULCAN DIVISION

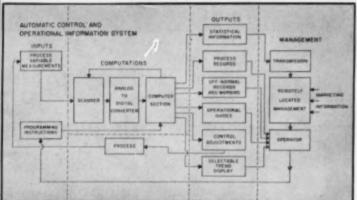
BLAW-KNOX COMPANY ERIE 4, PENNSYLVANIA





### ANALOG-DIGITAL INTEGRATING TRANSLATOR

The block diagram shows the Operational Information System being installed at the Sterlington (La.) Steam Electric Station.



# Louisiana Plant to Have AUTOMATIC INSTRUMENTATION

an important step toward fully automatic control of an entire plant is being made with an installation of a Daystrom operational information system at a new 200,000 kw unit of the Sterlington Steam Electric Station of Louisiana Power and Light Company. The plant is being engineered and constructed by Ebasco Services, Inc.

W. T. Hess, vice president and chief engineer of Louisiana Power and Light Company said, "We, Ebasco and Daystrom, Inc., are cooperating to develop and install the most modern instrumentation for power plant operation. When the new Sterlington Unit begins operation, we believe it will represent the most advanced method of producing electrical power anywhere in the world."

The Operational Information System will cover measurements at 350 points throughout the power plant. Of this total, 100 points will be automatically logged every hour. The system provides continuous scanning of the remaining 250 points which will read-out on a separate printer if they exceed set limits, with provision for an automatic alarm. The operator can,

at will, select any or all 350 points for readings. Thus, all significant information on the operation of the plant will be presented at one central point, literally putting the entire plant at the fingertips of one man.

The Operational Information System will make the plant safer, more efficient and will prevent damage to equipment during starting up and running.

The installation is expected to provide a degree of accuracy and reliability unattained in any previous system. Transistors rather than vacuum tubes are used throughout. All relays used are of the mercury wetted computer type. The equipment will include the first industrial use of a transistorized digital computer and the Dadit, a transistorized analog to digital converter.

The information system is one of the major components necessary for full automatic control. The design engineers believe this system represents the closest step to date toward closing the process loop. "It is the nearest approach to complete automatic control of the entire plant without need for any

human control other than programming of the computer to correct any variation from optimum operation."

The use of solid state elements throughout the system eliminates vacuum tubes, which are subject to sudden failure and consequently are the least reliable elements of conventional equipment.

Programming flexibility is another major feature of the system. Pinboards and patchboards used for programming in conventional equipment are completely eliminated and programming is accomplished by punching paper tape for all instructions including scanning sequence, sampling schedules, linearizations, scaling factors, alarm levels and conditions, temperature and pressure values for flow compensation and computation instructions.

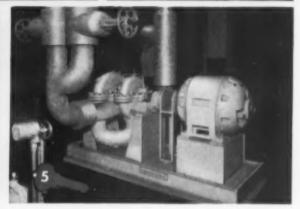
This is the first complete systems installation to be made by the Daystrom Controlonics Group. The manufacturers look forward to providing industries of all types with similar installations to assure maximum operating efficiency in any process. They believe it will be of particular importance to the chemical, petrochemical, food processing and steel manufacturing industries as well as the power industry. Its purpose is not merely to conserve manpower but to bring all phases of a process to highest efficiency, thus increasing product quality and production.











# Five Keys to LONG-RANGE ECONOMY on your general-purpose pumping jobs

The Ingersoll-Rand pumps shown feature several different designs and types. Yet they all have one thing in common—the ability to give you low-cost performance on your general purpose pumping jobs.

When you install an I-R pump, you can count on continued efficient operation—with a minimum of time out for attention and maintenance.

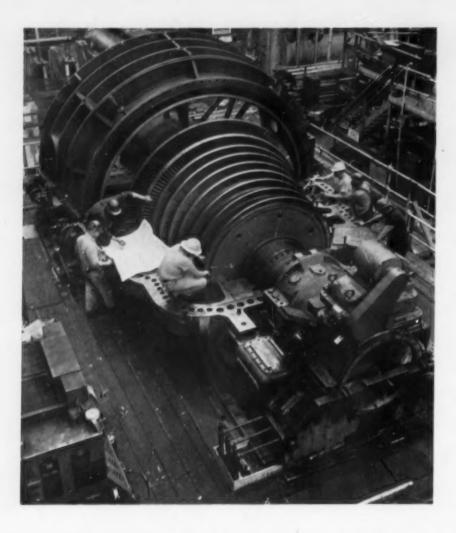
In addition to the pumps shown, Ingersoll-Rand manufactures a complete line of single and multistage pumps of horizontal and vertical design for every job application. See your I-R representative for full information on the pump which best meets your needs.

- 1. MOTORPUMPS: Free from base plates, couplings and alignment problems, I-R Motorpumps can be mounted in any position that gives the simplest, most economical installation. They are especially designed for continuous full load service, with a wide range of capacities from 5 to 1800 gpm and heads up to 600 ft. Available in single, two and four-stage units.
- 2. CRADLE-MOUNTED PUMPS: Built with separate pump and drive units, coupled and mounted on a sturdy base plate, I-R Cradle-Mounted Pumps come in one and two stages, with capacities from 5 to 2800 gpm and heads up to 525 ft. They can be equipped with any drive, and provide easier accessibility, over-sized bearings and greater accessibility.

- 3. SINGLE-STAGE HORIZONTALLY-SPLIT PUMPS, with double mechanical shaft seals: For capacities from 275 to 2400 gpm and heads to 350 ft., maintenance-free DMV and DHV pumps are provided with double mechanical shaft-seals and permanently lubricated sealed bearings. Troublesome stuffing box maintenance is eliminated, and bearings do not require any attention or lubrication throughout the life of the pump.
- 4. SINGLE-STAGE HORIZONTALLY-SPLIT PUMPS, conventional design: The Class AFV unit illustrated is typical of the standard I-R line of single-stage horizontally-split centrifugals, with capacities ranging from 25 to 50,000 gpm, and heads from 20 to 350 ft. Stuffing boxes are extra deep, and equipped with water seal cages. Any type of drive may be used.
- 5. TWO-STAGE HORIZONTALLY-SPLIT PUMPS: I-R twostage Class GT pumps are available in capacities up
  to 2200 gpm for discharge heads up to 1050 ft. Outstanding performance is assured by such
  features as extra deep stuffing boxes, renewable shaft sleeves and wearing rings,
  carefully designed liquid passages and
  volutes, and efficient closed-type impellers.

# Ingersoll-Rand 10-455 11 Broadway, New York 4, N. Y.

PUMPS · ROCK DRILLS · GAS & DIESEL ENGINES
COMPRESSORS · CONDENSERS · AIR & ELECTRIC TOOLS



This turbine will exhaust its steam horizontally along the axis of the turbine shaft and into the condenser, rather than downward into a condenser which is the usual arrangement on most of today's steam turbine-generator units. This new design is described as "axial flow exhaust."

## New Turbine Feature ..... South Carolina

A STEAM turbine-generator unit which embodies an important new feature is being manufactured for the South Carolina Gas and Electric Co. by the General Electric Company's Large Steam Turbine-Generator Department at Schenectady.

This unit will exhaust steam horizontally along the axis of the turbine shaft into the condenser. The condenser is attached directly to the exhaust end of the turbine instead of being located directly below the exhaust end of the turbine as in the usual installation.

This new feature in the South Carolina Gas & Electric Co. turbine is described as "axial flow exhaust," and has two important advantages, according to G-E engineers. First, it improves the efficiency of the turbine. This may amount to a coal saving of 2000 tons in a year's operation. The second advantage is a saving in the cost of the station itself.

Because the condenser is located at the same level as the turbine instead of beneath it, the turbine foundation and the overall height of the turbine room structure can be lower, resulting in lower construction costs.

This unit is the first of two such units to be installed in a new steam power station located on Lake Murray, and adjacent to the Company's Saluda Dam hydroelectric station.

The cooling water necessary to condense the steam from the turbine will come from the hydroelectric station, which takes water from the depths of Lake Murray. This water, from the bottom of the lake, is cold the year-round, seldom going above 55 F.

The turbine is described as a cross-compound, single-flow, reheat type with axial-flow exhaust. Steam from the boilers will enter the turbine at 2400 psig and 1050 F. The high-pressure element of the turbine revolves at 3600 rpm, and the low-pressure element at 1800 rpm.

### PROGRESS IN POWER ODGOOOD PROGRESS IN HEAT TRANSFER EQUIPMENT





Workman welding copper-nicket tubes to foot-thick steel tube sheet with 140-monel electrodes. Under destructive testing, rolled joints and tubes welded with cupro nickel rods leaked at elevated pressures, but tubes welded with 140-monel electrodes were leakproof at 9600 psi.



End view showing torus ring welded to channel and channel cover. Access to head is obtained by cutting ring with special tool; torus ring can be re-used. Conventional split key ring assembly taking the load on the cover is retained.

### FIRST ALL-WELDED FEEDWATER HEATERS

▶ A few years ago, an all-welded feedwater heater for 3600 psi and 790 F would have been called a fantastic dream.

Yet six all-welded feedwater heaters in this pressure-temperature range are now proving their worth in the Linden, N. J., Generating Station of the Public Service Electric and Gas Company. Designed and manufactured by the Yuba Heat Transfer Division, formerly the Heat Exchanger Division of The Lummus Co., these heaters represent one of the many "firsts" contributed by this organization to the progress of the power industry.

In the heater shown above, two 50-inch-diameter cylinder sections of 1½-inch carbon steel were welded together. The open ends of the U-bends are welded, not roller-expanded, into the tube sheet (see upper small photo). Heads are sealed by a steel torus ring welded to channel cover and channel (see lower small photo).

The all-welded design minimizes the leakage which occurs in the conventional bolted and gasketed construction under high temperatures and pressures. Results are reduced maintenance and downtime.

This all-welded construction has been so successful it is certain to be specified for practically all future installations. Yuba engineers would be pleased to work with you. Call on them.

### YUBA HEAT TRANSFER DIVISION

HONESDALE, PENNSYLVANIA

NEW YORK SALES OFFICE: 530 FIFTH AVENUE

CONSOLIDATED INDUSTRIES, INC.

Other Divisions Manufacturing Hout Transfer Equipment
California Steel Products Division, Richmond, Cal.
Adsce Division, Suffalo, N. Y.

STEAM SURFACE CONDENSERS . EVAPORATORS
STEAM JET REPRIDERATION . STEAM JET AIR EJECTORS
PRED WATER HEATERS . BAROMSTRIC CONDENSERS

### Do Your Men Know How to Be Careful?

## CHECK LIST HELPS PREVENT FIR

FIRES are likely where men are working on construction. Most industrial plants and production procedures are carefully designed and "policed" to assure reasonably safe practices. But few large plants are ever free from construction activity in one form or another: additions, modernization and big replacements.

Stone and Webster engineers are experts on construction. Experience has taught them the value of conscientious fire prevention procedures on construction work. Strict adherence to the few rules listed here can practically eliminate construction fires fires that could wipe out the entire plant.

GOOD HOUSEKEEPING and good maintenance are considered fundamental by Stone & Webster Engineering Corporation for preventing fires and protecting property on construction jobs in the power, chemical, petroleum, nuclear facility and other industrial

On all Stone & Webster jobs, the Superintendent of Construction is responsible for maintaining a continuing program for safeguarding all property connected with the

A special check list is used by job safety committees charged with safeguarding materials, machinery, equipment, permanent and temporary buildings and their con-

"Fire prevention and protection necessarily must keep pace with the construction program," says

the safety bull & Webster personnel.

"Concent fined or closely-grou avoided should be fire protec quate pro as soon ontents tempora are on the construction site.

"Location of fire-alarm boxes, fire-fighting equipment, such as extinguishers, water barrels, pails, hand-pump extinguishers, etc., hose, hydrants and valves should be located and marked conspicuously, and immediately available and protected against freezing or other damage."

This is the itemized check-list for fire prevention and protection:

### CHECK LIST FOR FIRE PREVENTION

### 1. Electrical Equipment

Switches Insulation Fuses Grounding

### 2. Matches or Smoking

Confined to Places Per-Safety Matches, Only, Used

#### 3. Heat Hazards

No Combustible Material in Contact with Steam Pipes, Furnaces, Flues. Ashes in Metal Containers Care and Maintenance of Salamanders and Their Location with Respect to Tarpaulins, Which Must Be Fireproofed

Protection of Combustible Materials, and Fire Prevention in Connection with Welding and Burning Operations

### 4. Flammable Liquids

Handling and Use Stored in Approved Place Safety Cans Used Tanks, Drums and Cans in Good Order No Leaks

### 5. Oil and Paints

Stored in Approved Place No Leaks Drippings Properly Disposed of

### 6. Combustible Materials

Stored in Approved Bins or Containers

#### 7. Oily Rags and Waste

All in Approved Metal Receptacles Disposed of Regularly

#### 8. Gas

No Leaks Turned Off When Not in

### 9. Refuse

In Approved Containers Disposed of Daily

### 10. Lockers and Closets

Kept Neat No Accumulation of Rubbish

### 11. Temporary Buildings

Housekeeping in and Around Building Ample Spacing Between **Buildings to Prevent Fire** Communicating Storage of Material and Equipment Availability of Fire Fighting Equipment

#### 12. Fire Fighting Equipment

In Place Easily Accessible In Working Order Sprinkler Valves Open Sprinkler Heads Unobstructed Alarms in Working Order Checked and Tested Frequently

## **Epoxy Resin Grout**

CONTINUING failure of grout on

an industrial gas engine driven compressors caused a search to be made for an improved machinery grouting material. Several types of conventional and expanding metal aggregate grouts with various methods of application have proven inadequate in severe cases.

The most promising machinery grout that we have used is a modified epoxy resin with an aggregate, originally formulated for use as an acid proof floor topping material. This material was investigated because of its high compressive strength, high tensile strength, extremely high grout to metal bond strength, and the short set-up time required.

Preliminary small scale tests indicate very little, if any, shrinkage and grout to clean cast iron bond strength of 1,000 to 1,400 psi in shear. Tensile bond strength appears to be as strong as the grout or about 2,000 psi. This material is also non-porous and completely oil resistant which offers a considerable advantage over ordinary grouting materials.

A full-scale test on a 1,000 horsepower, 330 rpm, gas engine driven compressor indicates that the material will satisfactorily sustain the vibration, loads and temperature (180 F maximum) imposed by the engine where other types of grout have failed.

In this test, the old grout was first chipped out, then the engine base and foundation were cleaned



By B. J. WARREN, Maintenance Engineer, Maintenance Engineer, Maintenance Engineering Section, Union Carbide Chemicals Company, Texas City, Texas.

by spraying with a steam, water and alkaline detergent solution to remove oily deposits, washing with a 50% muriatic acid solution to remove rust and scale and then washing with water. The foundation was allowed to dry completely before the grout was poured.

The grout was mixed and handled according to the manufacturers' recommendations to avoid possible toxicity effects, and then poured under the engine just as conventional grout is poured.

The engine was put into fullload operation 48 hours after the grout was poured.

Considerable difficulty was experienced in trying to pour the grout, which is very viscous. Several large voids are known to exist

MINISTER MADE

MINISTER MADE

MALENTER MADE

MALENT

in the test application. The possibilities of pumping the grout under the engine, drawing the grout under the engine with a vacuum and making a dry bed of aggregate first, then pouring only the resin into the aggregate are being investigated. It was also discovered in the test that ordinary oiling of the forms is inadequate to prevent adherence. Either a wax coating or a plastic film over the forms is recommended.

It is planned to continue both small scale and full scale tests to determine the best combination of methods and materials, and it appears that the use of Epoxy based grout materials may lead to permanent grouting of even the most difficult cases.

### **Proper Lubrication**

PLANT engineering personnel are well aware that savings from reduced maintenance and replacement cost, far more than compensate for the added cost of high grade lubricants. Plant operators, as well as equipment manufacturers, are relying more upon the honesty and technical knowledge of Lubricating Engineers or Technicians to obtain the proper lubricants for their equipment, as well as recommended lubrication intervals.

In most instances, the manufacturer of equipment approves certain lubricants or has a specific typical test to meet.

Due to changes in design of equipment, size, speeds, bearing material, etc., and since the oil companies continue to improve their lubricants, many manufacturer-approved lubricants are more or less obsolete.

In plants where Lubrication Surveys have been made, revised surveys should be made from time to time.

When an improved lubricant has been placed on the schedule, the Lubrication Engineer should inform his customers in order that they may take advantage of this improvement.

The modern machine usually consumes a small amount of lubricant; therefore, to purchase a product on price alone may result in costly repairs, downtime, etc., all of which results in loss of production.

By L. F. NEATHERLIN, Lubrication Engineer, The Texas Company, Oklahoma City, Okla.

# Atomic Trends ==

# Survey of Nuclear Power Technology

By JOHN F. LEE

SPI Consultant on Atomics and Professor of Mechanical Engineering North Carolina State College

MANY TYPES of nuclear power

reactors are now in the process of design or under contract for construction in the near future. In the quest for economic nuclear power each new type of reactor offers some important advantage not possessed by its predecessors. These advantages are, of course, achieved at the cost of certain disadvantages.

One can hardly predict at this time which type of power reactor will emerge as the best suited for reliable power generation at costs competitive with those of conventional power plants. It is likely that no single type of general-purpose power reactor will emerge at all. More likely, a select few will offer particular advantages for specific applications.

Sufficient development and design of power reactors have already taken place to make a critical survey of their characteristics of value to anyone contemplating a study of the nuclear power situation. Sufficient technical details are given to make the discussion intelligible to the reader without

obscuring the main features with too much detail.

### **Basic Reactions**

Nuclear fission occurs when a heavy element, such as uranium-235, is bombarded by a neutron which causes the atom to split into two fragments of nearly equal mass with the emission of high-speed neutrons.

The neutrons released in one fission may fission other atoms in a sustained nuclear process called a chain reaction. However, not all the neutrons released in fission are available for this purpose because some escape or are captured by nonfissionable material.

If more neutrons are available for fission than are lost, the chain reaction is sustained. Otherwise the reaction will stop. On the other hand, if the number of neutrons available for fission at the end of each step in the nuclear reaction increases, the reaction is uncontrolled as in an atomic bomb.

#### Control Rods

It is clear that a power reactor must sustain a *steady* chain reaction with a constant number of neutrons available at the end of each step in the nuclear reaction. Hence control rods made of materials which absorb neutrons, such as boron or cadmium, are used to regulate the population of neutrons in the reactor.

Since the neutron captive power of the control rod is a function of the control rod surface exposed to the reaction, regulation is obtained by varying the amount of surface exposed to the reaction. This is accomplished by positioning the control rod. When the control rods are pushed down so as to be completely exposed to the reaction, all the neutrons are absorbed and the reaction stops. By pulling the rods up, the exposed surface is decreased and regulation is a function of the position of the rods.

### Moderators

The neutrons released in fission are at extremely high velocities. Not all nuclear fuels can be fissioned by these fast neutrons. Uranium-235, uranium-233, and plutonium-239 are examples. To fission these materials the neutrons must be slowed down to what is called a thermal level.

Hence a reactor which is designed to fission these materials must have a *moderator* which has the ability to slow down neutrons without absorbing them. Beryllium, beryllium oxide, carbon, ordinary water and heavy water

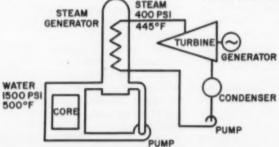


Fig. 1 Typical Pressurized Water Reactor

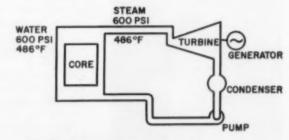


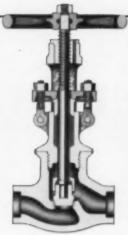
Fig. 2 Typical Boiling Reactor

Newest Design in Small Steel Globe, Angle and Check Valves



# Crane Lip Seal Bonnet Valves

Save Money for This Power Plant





Central Illinois Electric & Gas Co.'s experience with Lip-Seal valves is typical. Since 1952, this patented Crane small steel valve design for high-pressure/high-temperature service has saved this utility many dollars.

Shown is a 3-valve installation at Sabrooke Station in Rockford on 900 psi steam lines to the ash removal system. In more than 5 years on this tough service, none was given more than minimum routine maintenance—never any attention to bonnet joints.

On other severe services as well, the plant is aware of the continuous good performance and easy care of Lip-Seal valves. More are being installed as other makes give out.

Lip-Seal design features a strong, nonfreezing screwed bonnet joint that holds pressure load, with a peripheral weld for tightness only. Weld grinds off easily and repeatedly without damaging joint.

Improved disc-stem connection minimizes vibration...provides pilot guiding for the disc. Stellite seating surfaces withstand temperature, corrosion and erosion. Globe, angle and check patterns; 1500- and 2500-pound classes. Sizes ½ to 2 inches. Get full information from your Crane Representative.



Literature on Lip-Seal valves supplied by your Crane Man, or write to address below.

# CRANE VALVES & FITTINGS

PIPE . PLUMBING . KITCHENS . HEATING . AIR CONDITIONING

Since 1855 - Crane Co., General Offices: Chicago 5, Ill., Branches and Wholesalers Serving All Areas

are suitable materials for a mod-

Some fissionable elements, such as uranium - 238, thorium - 232, practinium-231 and neptunium-237, can be fissioned by only fast neutrons. In this case a moderator is not only unnecessary but actually undesirable. A reactor in which the neutrons must be slowed down to thermal levels is called a thermal reactor. The unmoderated reactor in which fast neutrons are used is known as a fast reactor.

### Coolants

Whether the reactor is thermal or fast, energy is released during the nuclear reaction process. This energy eventually appears as heat and the reactor would obviously be destroyed if a coolant were not used. Of course the coolant must have good heat transfer and transport properties as well as the characteristic of not absorbing neutrons. The coolant may do double duty as both moderator and coolant. For example, water has good heat transfer and moderating properties and hence is suitable for the dual function of a moderator and a coolant.

### **Types of Plants**

Nuclear power plants may be broadly classified as nuclear steam power plants and nuclear gas-turbine power plants. Within these two classifications the power plant is further defined in terms of the type of reactor employed.

The principal types of nuclear reactors proposed for power plants are:

- 1. Pressurized-Water Reactor
- 2. Boiling Water Reactor
- 3. Dual-Cycle Reactor
- 4. Aqueous-Homogeneous Reactor
- 5. Sodium-Graphite Reactor
- 6. Liquid-Metal-Fuel Reactor
- 7. Gas-Cooled Reactor
- 8. Fast-Breeder Reactor

The first seven reactors are all thermal reactors and the eighth reactor, as its name implies, is a fast reactor. The first three reactors are water moderated and cooled. The fourth reactor is water moderated and cooled by an aqueous solution of uranyl sulfate. The fifth reactor is cooled by

liquid sodium and moderated by graphite. The seventh reactor is, as its name implies, cooled by a gas and is usually graphite moderated. The sixth reactor may be cooled and moderated by any suitable substance or substances. The eighth reactor is usually cooled by a liquid metal, such as sodium, which has good heat transfer properties but poor moderating characteristics.

Each of these reactors offers certain advantages and disadvantages in terms of stability of operation, functional simplicity, adaptability to specific applications, investment cost, and power cycle efficiency.

### Pressurized-Water

The pressurized-water nuclear reactor is used in the power plant of the submarine Nautilus, Shippingport Nuclear Power Plant of Duquesne Light Company, Indian Point Nuclear Power Plant of Consolidated Edison Company of New York, The Yankee Atomic Power Plant of Yankee Atomic Electric Company, and the Army Package Nuclear Power Plant at Fort Belvoir. Hence it may be said that the pressurized-water reactor is the most widely used and is the first demonstratedly successful power reactor.

The pressurized-water reactor utilizes ordinary water as both coolant and moderator. The water is maintained at a high pressure to prevent the generation of steam in the reactor core. The pressure of the water ranges from 1200 to 200 psi depending on the temperature levels reached by the coolant in the reactor.

The pressurized water leaves the reactor core at temperatures ranging from 450 F to 540 F and passes to exterior steam generators of tubular design where feedwater from the feedwater heaters of the power plant is generated into steam.

The pressurized water returns to the reactor at temperatures ranging from 431 F to 480 F to 510 F. Figure 1 shows a simplified diagram of a typical pressurizedwater reactor power plant.

The thermal efficiencies achievable in a pressurized-water nuclear power plant range from 20 to 26%.

The Indian Point station utilizes an oil-fired superheater to superheat the slightly wet steam leaving the steam generators of the reactor. With this modification a thermal efficiency of 32% is expected.

The principal advantages of a pressurized-water reactor are stability, reliability and moderate complexity. More experience has been gained in the operation of this reactor than any other type and capital investment, especially with an oil-fired superheater, is not unreasonable as nuclear power plants go. However, the reactor vessel and piping must be designed for high pressure (2500 psi for an operating pressure of 2000 psi) and the vessel is extremely large.

All of these factors point to high costs which are not likely to be alleviated with knowledge gained from design and operating experience. It is clearly apparent that capital costs for small and medium sized power plants using pressurized-water reactors are likely to be prohibitively high.

### **Boiling-Water Reactor**

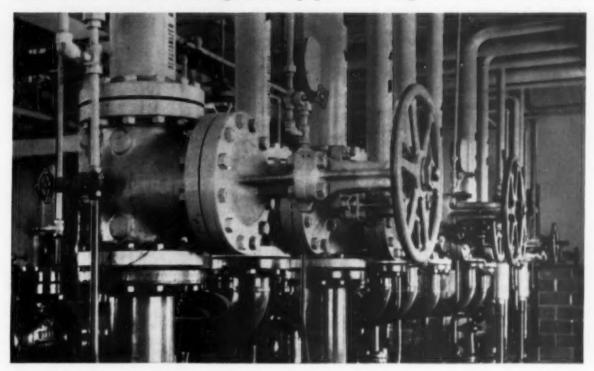
It would appear that the design pressure of the reactor could be reduced and the system simplified through elimination of the exterior steam generators if water were generated into steam in the reactor core. Originally, it was thought that the nuclear reaction would be completely unstable if steam were generated in the reactor core. However, recent experiments indicate that stability can be obtained.

A reactor in which the water coolant is generated into steam in the reactor core is called a boiling-water reactor. A 5000-kw experimental boiling-water reactor (EBWR) power plant recently went into operation at Argonne National Laboratory. It is expected that experiments conducted at this installation will lead the way to a practical boiling-water nuclear power plant.

Figure 2 is a simplified diagram of a typical boiling water nuclear power plant showing the simplification of the system. The efficiency of this type of plant is expected to be about 28%. The pressure in the reactor is reduced and at the same

# Don't Hedge on Quality When You Buy Steel Valves...

Maintenance costs can gobble up your savings in a few months!



LUNKENHEIMER QUALITY is no longer a luxury—it's your vitally needed insurance against today's sky-high maintenance expense. Labor rates are going still higher... "downtime" costs are multiplying... repair charges are rocketing up—with no relief in sight. Today, it pays to buy the best valves you can get, with no hedging on quality. Your purchase of Lunkenheimer Steel Valves is an investment that pays

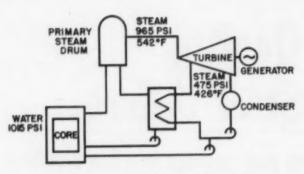
worthwhile dividends in maintenance savings . . . year after trouble-free year. The Lunkenheimer Company, Box 360, Annex Station, Cincinnati 14, Ohio.

The cost of a LUNKENHEIMER VALVE Gets smaller...and smaller...and smaller...
with each passing year of dependable service
A check on the cost of maintaining your
cast steel valves will prove this point.

STEEL . BRONZE . IRON . PVC



THE ONE GREAT NAME IN VALVE'S





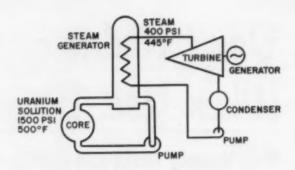


Fig. 4 Typical Aqueous Homogeneous

time the steam pressure is increased.

There is, however, the problem of an inherently unstable system since a sudden increase in load will decrease the pressure in the reactor causing the steam bubbles to expand which action makes the reaction slow down. Then as the bubbles start to shrink because of the reducing reaction rate the reaction rate increases and the control system responds to the increase in the reaction rate. This poses a difficult control problem.

Another problem arises from the fact that the turbine, condenser, feedwater heaters and pumps are exposed to radioactive steam which complicates maintenance.

#### **Dual-Cycle Reactor**

Close kin to the boiling-water reactor, is the dual-cycle reactor. Water is used as both coolant and moderator in this type of reactor. In one type of dual cycle reactor, about 10% of the cooling water is generated into steam in a drum located above the reactor and the water not evaporated is flashed into steam at a lower pressure and introduced to the turbine at an appropriate point.

Another type of dual-cycle reactor will be used in the 180,000-kw Dresden Station of Commonwealth Edison to be erected near Chicago. In this reactor the unevaporated water leaving the steam drum above the reactor is sent to a secondary heat exchanger where a part of the feedwater returning from the feedwater heating system is generated into steam. Steam is generated in the primary steam drum at a pressure 965 psia and a temperature of 542 F and in the secondary steam generators at 475

psia and 462 F. A thermal efficiency of 29% is expected.

The dual-cycle plant offers the advantages of better stability than an outright boiling-water reactor, moderate system pressure, high heat transfer rates and simplified functional design. The problem of radioactive steam is somewhat diminished. The simpler design is expected to result in major reductions in capital costs. Figure 3 is a simplified schematic diagram of a dual-cycle reactor power plant.

#### Aqueous-Homogeneous

All of the reactors discussed thus far are of the heterogenous type. That is, the fuel, moderator and coolant are separated except for the fact that the same fluid (water) serves as both moderator and coolant. The fuel is in the form of a solid which is machined and fabricated into cylindrical fuel elements covered by protective metal cladding. The homogeneous reactor is very different from reactors previously discussed — here the fuel, moderator and coolant are intimately mixed in a liquid solution.

In the aqueous-homogeneous reactor water is used as the moderator in a homogeneous solution of fuel and water comprising the reactor coolant, moderator and fuel "element." Thus the costly fabricated fuel elements of the heterogeneous reactor are eliminated. Figure 4 is a simplified diagram of an aqueous-homogeneous reactor power plant. It will be noted that the uranium solution passes through a steam generator in which the cycle steam is generated.

The aqueous-homogeneous power plant is subject to the same temperature and pressure limitations as the pressurized-water power plant. The uranium solution is corrosive and it is not a simple matter to maintain the fuel in solution.

Pumping of the slurry poses certain problems including erosion due to the tendency of the fuel to separate from the solution. However, the elimination of costly fabricated fuel elements and the possibility of continuous reprocessing of the fuel, since it is in a liquid solution, are important advantages. Perhaps the most important single advantage is the absolute stability of this type of reactor.

Research on aqueous-homogeneous reactors is being carried out at Oak Ridge National Laboratory. Westinghouse Electric Corporation and Pennsylvania Power and Light Company have joined in the development of an aqueous-homogeneous reactor which will be part of a 150,000-kw power plant expected to be in operation by 1962.

#### Sodium-Graphite

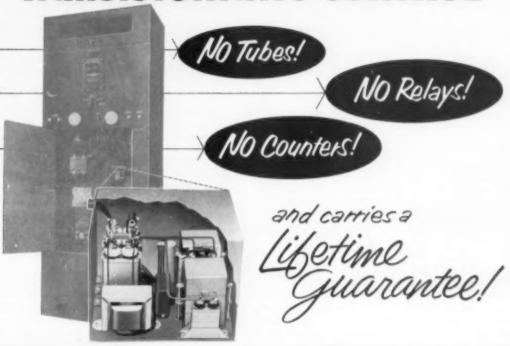
The sodium-graphite reactor is of the heterogeneous type with molten sodium used as a coolant. Since sodium is not a moderating material solid graphite is used as a moderator. Hence, both the fuel and moderator are solid elements in this type of reactor. The use of liquid sodium permits high coolant temperatures ranging up to 1000 F. Furthermore, the reactor pressure is nominal and sodium is virtually non-corrosive. Steam at a pressure of 1000 psi and at a temperature of 900 F can be generated by the high - temperature liquid sodium coolant permitting plant thermal efficiencies as high as 34%.

Sodium poses certain disadvan-

BY FAR, the Industry's Most Advanced Precipitator Control ...

THE WESTERN PRECIPITATION

## "Transistomatic CONTROL



In the electrostatic precipitation of dust, fume and fly ash, no installation is completely modern without automatic control to maintain optimum Precipitator efficiency as the characteristics of the gas stream fluctuate. Compared with manual control, automatic control is not only more sensitive and more efficient, but actually costs less because of the vital savings it makes in labor and operating costs . . . savings so important that no profit-minded operator will want to be without them.

But the important point to remember is this— Although many manufacturers of precipitation equipment offer units for precipitater automation, no other unit is equal to the "Transistematic" Control for foolproof simplicity, rugged dependability or control accuracy!

These are not idle claims. They can be easily verified by making your own comparison . . .

base its "sensing" action on spark frequency alone—or spark intensity alone.

Instead, it continuously integrates BOTH frequency and intensity to establish an overall "power value" that provides a new standard of control accuracy!

Compare DEPENDABILITY! The "Transistomatic" unit contains no parts of any kind requiring regular replacement. Moreover, the entire unit is completely sealed—moisture-proof and watertight.

Compare GUARANTEES! The "Transistomatic" is so foolproof and trouble-free it carries a lifetime guarantee!

SIFORE YOU SUY ANY automatic precipitator control, be sure to get the complete "Transistematic" story. A folder is available giving facts and figures. Or see your nearest Western Precipitation representative for further details!



WESTERN

#### PRECIPITATION

CORPORATION

Express and Constructors of Equipment for Conference of Europeand Material from Europe. . . and Equipment for the Process Industries
LOS ANGELES 54 - NEW YORK 17 - CHICAGO 2 - PITTSBURGH 22 - ATLANTA 5 - SAM FRANCISCO 4

\*\*Processorial funds of the Processorial Indiana Conference on the Indiana Conference on Indiana Conference o

Precipitation Company of Canada Ltd., Dominion Square Bldg., Montreal



A DESCRIPTIVE BOOKLET

that gives further facts and figures will gladly be sent on request. Write, wire or phone our nearest office!

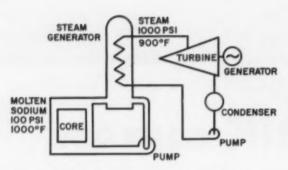


Fig. 5 Typical Sodium Graphite Reactor

STEAM 1000 PSI 900°F TURBINE GENERATOR

URANIUM BISMUTH SOLUTION 100 PSI 1000°F PUMP

PUMP

PUMP

Fig. 6 Typical Liquid Metal Fuel Reactor

tages in that it reacts violently with water and oxygen. It also becomes a strongly radioactive gamma-ray emitter when exposed to the neutrons in the reactor core. Hence a secondary sodium loop which is not radioactive is inserted between the primary coolant loop and the steam loop. The use of a solid moderator such as graphite tends to make the reactor large.

Figure 5 is a simplified diagram of a typical sodium-graphite reactor power plant. North American Aviation, Inc., has developed and constructed an experimental sodium-graphite reactor at its field laboratory near Canoga Park, California. The Consumers Public Power District of Nebraska plans 75,000-kw nuclear power plant incorporating a sodium-graphite reactor.

#### Liquid Metal Fuel

As the name implies, uranium is dissolved or suspended in a molten metal, such as bismuth, in a liquid-metal-fuel reactor. The objectives are a lower cost reactor of simplified geometry, higher temperatures and efficiencies, elimina-

tion of costly fabricated fuel elements, and simplification of the fuel reprocessing. Figure 6 is a simplified diagram of a typical liquid-metal-fuel reactor power plant indicating low reactor pressure and high steam pressures and temperatures.

This type of reactor is stable although its stability does not approach that of the aqueous-homogeneous reactor. Corrosion problems are of some concern as are the problems associated with the handling of a heavy molten metal. Another problem is the toxicity of bismuth and polonium created by the neutron capture in bismuth. This type of reactor is still in the experimental stage with a developmental installation at Brookhaven National Laboratory.

#### Gas Cooled

Gas-cooled reactors are of the heterogeneous type with solid fuel elements and solid moderator elements. A gas is used as the coolant. Gas-cooled reactors can be used for steam power plants as in the Calder Hall Atomic Power Plant in England or for nuclear gas-turbine power plants. It is likely that the

primary impetus for the development of a gas-cooled reactor will come from a desire to achieve a nuclear gas-turbine power plant.

Figure 7 is a simplified diagram of open-cycle and closed-cycle gasturbine power plants utilizing gascooled reactors. In the open cycle, atmospheric air is drawn into the compressor from which it passes either directly to the reactor or by way of a regenerator. The air is used as the reactor coolant and in the process becomes heated before expansion in the turbine. The air leaving the turbine is then either rejected to the atmosphere or passes through a regenerator before being rejected.

In the closed cycle a better cooling gas, such as nitrogen or carbon dioxide can be used. Compressed gas leaves the compressor, passes through a regenerator, then passes through the reactor where it is heated before expansion in the turbine. Gas leaving the turbine passes through the regenerator and then through a cooler before returning to the compressor to begin the cycle again.

The advantages of the closed cycle are that the system pressure

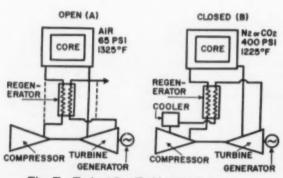


Fig. 7 Typical Gas Turbine Cycles

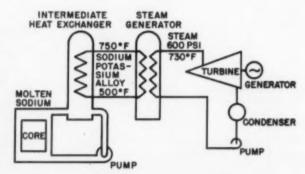
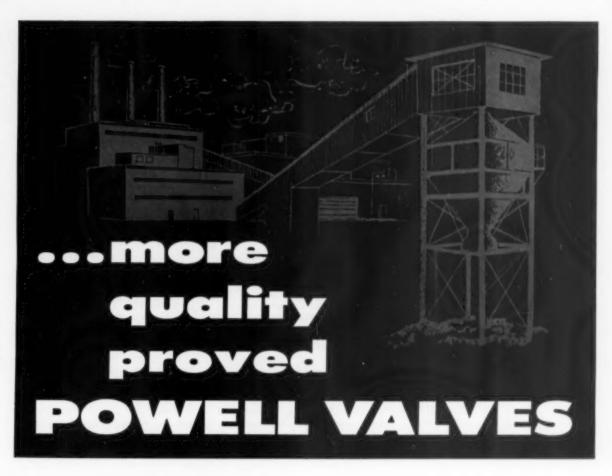


Fig. 8 Typical Fast-Breeder Reactor





#### Designed for long life, designed for dependable service

Consult your Powell Valve distributor for all the facts about quality proved bronze, iron, steel and corrosion-resistant valves. For every flow problem . . . there is a Powell Valve to solve it.

THE WM. POWELL COMPANY, CINCINNATI 22, ONIO . . . 111th YEAR

can be increased, an inert and clean coolant gas can be used and no radioactive gases need be rejected to the atmosphere.

The principal advantages of a nuclear gas turbine power plant over a nuclear steam power plant are reduced capital costs, higher thermal efficiencies (ranging up to 30% for open cycles and as high as 35% for closed cycles), freedom from the need for condenser cooling water, and a greatly simplified system.

The nuclear gas-turbine power plant has not yet received the attention accorded the nuclear steam power plant because some serious obstacles in reactor technology must be overcome. The gas temperatures entering the turbine must be as high as 1300 F for a workable power cycle.

This high temperature requirement means that the fuel elements in the reactor would have to be exposed to temperatures of the order of 1500 F. Fuel elements which will withstand these temperatures are not yet available. A similar problem exists for the moderator which would have to clad, or an expensive moderator

such as beryllium oxide would need to be used.

The nuclear gas-turbine power plant, nevertheless, bears watching as the results of classified research in this field are released. At least one commercial nuclear gas-turbine power plant is planned. It is for the City of Holyoke, Massachusetts. Fiat of Italy in cooperation with Westinghouse Electric Corporation and American Turbine Corporation in this country are devoting considerable research effort to a nuclear gas-turbine power plant.

#### Fast-Breeder

A breeder reactor, sometimes called a conversion reactor, utilizes excess neutrons available from fissioning to convert uranium-238 into plutonium-239 or thorium into uranium-233. This conversion may take place with either fast or thermal neutrons. However, the fission of the products, uranium-233 and plutonium-239, depends on fast neutrons. The fast neutrons are obtained simply by omitting the moderator from the reactor.

The 156,000-kw Enrico Fermi Nuclear Power Plant of Detroit Edison Company employs a fastbreeder sodium-cooled reactor in which uranium-238 is converted into plutonium-239 and fissioned.

Figure 8 is a simplified diagram of a typical fast-breeder reactor nuclear power plant. The liquid alloy of sodium and potassium is used as a secondary-loop fluid. This plant does not differ essentially from the sodium-graphite reactor except for the omission of the graphite moderator.

The principal advantage of this type of reactor is the possibility of breeding more fissionable material than is consumed, thus resulting in a possible negative fuel charge. However, this ideal state is difficult to attain and actually more fissionable material is consumed than is produced. Nevertheless, this factor is important in the reduction of fuel costs.

Countering the lower fuel costs is a larger capital investment brought about by the use of natural uranium which requires a large reactor. Another factor to be considered is the higher maintenance cost due to rapid deterioration of fuel elements.

#### **Better Low-Speed Drive**

QUIETER, smoother and more economical operation is reported by Mr. Emmett Koff, Manager of Featherlite Company of San Antonio, producer of lightweight concrete aggregate since the installation of five complete new drives for brick-lined rotary kilns using

power transmission equipment produced by Dodge Manufacturing Corporation, and sold by Midcap Bearing Service in San Antonio.

Conveyors deliver shale from storage to the high end of rotary kilns six feet in diameter and 70 ft long. Here the shale is heated and slowly tumbled until it falls out the front or low end of the kilns as clinker, there to be crushed, screened and shipped to concrete ready-mix and concrete block plants.

Girth gears encircling kilns are driven by five horsepower motors through Torque-Arm Speed Reducers with output speed at 12 rpm to rotate kilns at 1½ rpm. Shafts are carried by Dodge-Timken Special Duty pillow blocks. Five-groove sheaves are equipped with Taper-Lock bushings, and Dodge Sealed-Life V-belts are used. This installation has been operating successfully for more than three years.



**#Whally awned subsidiary of South Caroling Electric & Gas Co** 

## REPUBLIC Automatic combustion controls Auticipate fuel-air-water requirements:

Adjusts fuel, air and water as steam flow changes Makes follow-up adjustment of header pressure and water level if needed Prevents (rather than corrects) most pressure, level and temperature fluctuations before they happen!

Planned expansion of power in the Southeastern United States is typified by the addition of Unit #3 to South Carolina Generating Co.'s Urquhart Station. Rated capacity of the steam generator is 700,000 lb/hr at 1825 psi, superheated to 1010 F and reheated to 1010 F. Designed by Gilbert Associates, Urquhart #3 is modern in performance as well as appearance.

REPUBLIC's "Electronic Master" combustion control and triple-element feedwater control permit firing of pulverized coal, natural gas, or both at once without fluctuation of header pressure or water level. This system starts adjusting fuel, air and water as soon as steam flow changes perceptibly, not waiting for either drum level or header pressure to change.

If either of these factors change despite the preliminary adjustment, the change will be very small and will be off-set immediately by a follow-up control that modulates the existing control signal. Since the flow of flue gas is held in such close proportion to the steam flow, temperature at the superheater outlet is held very close to a constant 1010 F despite load swings.

This advanced control system is a logical partner to the advanced thinking apparent throughout Urquhart #3. The quick action of electronic control added to the traditional reliability and power of pneumatic actuation pro-

duces a stable, accurate, dependable automatic system. And any one or all of the automatic control functions can be cut out at will to permit substitution of remote manual control at any time. Manual controls include indicators for electronic loadings of the regulators and positioners as well as position and rate of response indicators.



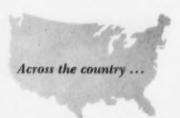
Control room of Urquhart Station's modern Unit #3.

#### NEED HELP on "Early Stage" Planning?

Remember that Republic, too, is planning ahead. To get the latest information on developments that will effect control in your future power or processing plant, contact the REPUBLIC Engineering Department as soon as such help would be beneficial.

## REPUBLIC FLOW METERS COMPANY

A Subsidiary of Rockwell Manufacturing Company 2240 Diversey Parkway, Chicago 47, Illinois



## EUTECTIC WELDING ALLOYS

Sales • Service • Research is only as far away as a phone call or letter to any of the following warehouse-service cen-

WASHINGTON, D.C. STerling 3-3480 **PADUCAH 3-5222** MEMPHIS FAirfax 4-1511 MIAMI PL 4-7044 FT. WORTH ENterprise 2264 JACKSONVILLE ELgin 5-2057 MOLINE 3-8070 **TULSA Riverside 2-4783** BIRMINGHAM LYric 2-7883 KIRKWOOD TAylor 1-5508 BALTIMORE PLaza 2-5022 **COLUMBUS CApital 8-1664 NEW ORLEANS RAymond 9089 HOUSTON FAirfax 3-0637** LITTLE ROCK FRanklin 4-1401 **CHARLOTTE FRanklin 7-4575** 

Eutectic Welding Alloys Corporation 446 Northside Dr., N.W., Atlanta 18, Ga. JACKSON 3-3552

Eutectic Welding Alloys Corporation 2204 Irving Boulevard, Dallas 7, Yexas Riverside 1-5829

Eutectic Welding Alloys, St. Louis Inc. 3719 Vest Avenue, St. Louis 7, Missouri GEneva 6-4644

When you need a Eutectic District Engineer for on-the-spot assistance, you'll get immediate action by any of the centers.



PLANT, RESEARCH LABORATORIES

®Registered Trade Mark of

EUTECTIC WELDING ALLOYS CORP.

#### **Tennessee Plant Revises Wiring System**

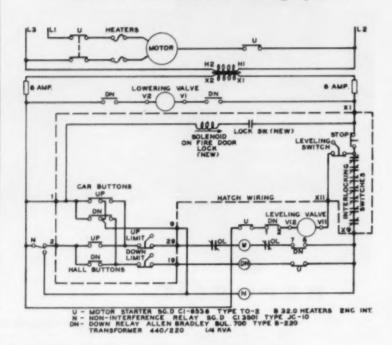


Diagram Showing Wiring Revisions

### **Hydraulic Elevator Modernized**

MANY DESIGN engineers are distinctly committed to the use

tinctly committed to the use of hydraulically operated elevators for freight service. This type of equipment is admittedly slow in comparison with its speedier brother the traction car, but in the long run its trouble-free service endears it to the heart of the maintenance chief who must live with all the hoist problems man is heir to.

The wiring system of the hydraulic car is quite simple and any incipient troubles are usually quite easily diagnosed since the control circuit is essentially of a series nature where a quick check through soon reveals the offending device or conductor.

The wire diagram illustrates some revisions made at the time of remodeling a 16,000 lb capacity hydraulic elevator which in addition to the conventional two doors, or gates, at opposite ends of the car now has an auxiliary door opening placed in a car wall section.

A step-down transformer of the dry type was employed to reduce the normal 440 voltage to 220 volts in order to employ a special type of solenoid fire door lock available in a larger varity in the 220 volt class.

The new, lower voltage is also better adapted to safe operation of the push buttons in the car as well as the hall buttons and the various interlocks on both car and shaft gates, plus the upper and lower limit switches.

By PAUL C. ZIEMKE Clinton, Tennessee

See . . . P 3
Free Catalogs . . . . P 88
New Product Briefs . . . P 96

EUTECTIC Welding News

PLANT, RESEARCH LABORATORIES and WORLD HEADQUARTERS

Published by EUTECTIC WELDING ALLOYS CORPORATION

40-40 172nd STREET, FLUSHING St. NEW YORK.

## FAST OVERLAY FOR CAST IRON DIE-

LOWER COST-LONGER SERVICE

Constant use was wearing away large cast-iron forming dies used by a Canadian railway car manufacturer. The company wanted any repair to be harder than the cast-iron itself.



A "Eutectic" District Engineer was consulted, and recommended that the forming dies be rebuilt by overlaying with EutecTrode 130 (AC-DC).

EutecTrode 130 (AC-DC) is specially designed for a hard overlay on cast iron and steel which is subjected to constant wear. Its "Frigid Arc" coating helps produce deposits with a hardness of Rockwell C45-47 as deposited: at lowest temperatures. Slight peening and multiple layers increases this hardness to RC 62! Deposits are smooth, dense and offer exceptionally high resistance to wear and corrosion. The low welding temperatures possible with all "Eutectic" alloys avoids the difficulties of embrittlement and warping, common when conventional high heat welding materials are used on cast iron.



Figure (1) shows the building up process with EutecTrode 130 (AC-DC) well on its way. In figure (2) the die is in the final stages of being refinished with this superior alloy. The manufacturer was astonished at the results obtained. After two months of constant use the forming die blocks (B-16)

show virtually no wear.

#### HIGH-HEAT DISCOLORATION **NAVY SeaBees LEARN NEWEST ANTARCTIC ELIMINATED ON STAINLESS STEEL** WELDING TECHNIQUES

The high heat needed with conventional silver solder caused discoloration of a new stainless steel mixing valve. This forced the manufacturer into an extra grinding and polishing operation, which considerably increased the unit cost.

On a regular shop call the "Eutectic" District Engineer suggested EutecRod 1801.

EutecRod 1801 is a universal, low-melting silver type alloy with a high tensile strength of 90,000 psi...a perfect combination for stainless steel. It is ideally suited for delicate parts and light gage metals. Tests with EutecRod 1801 showed that the lower heats possible with this "Eutectic" alloy eliminated the troublesome discoloration. Faster joints were possible too, because of the thin flowing properties of this highly developed alloy. The finished joint was strong, leakproof and corrosion resistant.

Now, using EutecRod 1801 to assemble his mixing valves, the manufacturer reports that the elimination of extra polishing and cleaning, as well as increased production, effected savings of \$15,000 a year. (B-17)

A U.S. Navy Construction Training Unit was recently instructed in the latest "Low Heat Input" metal joining methods and alloys by a demonstration team from Eutectic Welding Alloys Corporation. The training unit was part of a Steel Working School at the Rhode Island SeaBee Con-struction Base. The "Eutectic" demonstration emphasized techniques and alloys specially suited for below zero service conditions. SeaBee construction crews will soon leave for the Antarctic in prepara-tion for the U.S. Navy's participation in the 1958 International Geophysical Year.

Special attention was directed at EutecRod 21 and EutecTrode 2101 (DC Reverse).



EutecRod 21 is a torch aluminum alloy for high strength fillet and bead joints on

wrought forms, extrusions and cast aluminum...ideal for architectural and general building use. EutecTrode 2101 (DC Reverse) is a new, patented electrode with extruded "frigid arc" flux coating. Designed for heavier aluminum castings, long joints, filling defects and overlaying, its extruded coating makes it easy to trol. Both of these alloys have been found highly adaptable to sub zero service conditions.



Q. Please give us precedure for rebuilding and hard surfacing manganese pressure jaws on gravel crushers. Conventional materials always cause distortion and buckling.

A. Manganese jaws of this type can be surfaced with EutecTrode 2 as is, or followed by subsequent layers of EutecTrode 12. For maximum impact resistance, we suggest padding of either EutecTrode 4 or EutecTrode 680 applied directly to the manganese jaws, over which apply EutecTrode 12.

Q. We would like information on overlaying nickel-manganese parts of our shot-blost unit.

HEADLINES • TIME • MONEY • MACHINERY

A. Assuming the overlay is subjected to heavy impact in service, we would recom-mend EutecTrode 4. Apply directly to the nickel-manganese parent or, for extremely heavy sections, after a preheat of 500°F Under certain conditions it is desirable to apply EutecTrode 680 directly to the nickel-manganese base metal without preheating and build up with subsequent layers of EutecTrode 4.



**Eutectic Warehouse - Service Centers** 446 Northside Drive, N. W., Atlanta 18, Ga. 2204 Irving Boulevard, Dailas 7, Texas

	Gentle	men:			
	would following		further	free	information
	B-16		□ B-	17	□ B-1
	Free: No Data Bo		58 180	page	pocket Weldin
Nan	ie				
Busi	ness Ad	idres	s		
				Stat	

EUTECTIC WAREHOUSE-SERVICE CENTER · 446 NORTHSIDE DRIVE, N.W., ATLANTA 18, GA. EUTECTIC WAREHOUSE-SERVICE CENTER · 2204 IRVING BOULEVARD, DALLAS 7, TEXAS

## **Employees Help Cut Costs**

THE SOUTH'S largest steelmaker

— United States Steel's Tennessee Coal & Iron Division — has discovered what it considers a sure-fire method for day-to-day improvement of its operating efficiency. The secret lies in letting every member of the company take a part in improving output and performance.

Long a believer in employee suggestion plans, the TCI division now offers its 25,000 employees a chance to earn from \$10 to \$10,000 for their individual suggestions on how to do the job of steelmaking better and more efficiently. Each year hundreds of employees take advantage of the company's offer. As a result, hundreds of new and more economical operating methods have been introduced in every phase of the manufacture of steel, from iron ore to finished product.

#### Examples

Following are typical examples of the steady flow of efficiencyboosting ideas contributed each day by TCI workmen on the job.

- ♦ Cecil B. Veazey, a chief order clerk, several months ago devised a new procedure for cropping the steel ingots used in producing a certain type of sheet steel. The new method prevented scrapping of a certain portion of the steel in each ingot of this type. Following experiments with the wastesaving procedure, TCI recently adopted it as permanent practice.
- ♦ H. G. Tucker, a rolling foreman recently recommended that scrap rolls from one rolling mill be cut and shaped into dicse for a straightening machine in another department of the mill. The idea has added another cost-cutting innovation to TCI's steelmaking operations.
- ♦ Materials handling has long been one of the big cost items

- in heavy industry. William C. Cook, an industrial engineer, developed a more economical method for handling refractory bricks and other materials used for repairing TCI's iron and steelmaking furnaces. J. T. Henderson, supervisor of stores at TCI's Fairfield Sheet Mill, devised an improved method of loading and storage of blocking lumber. Both innovations brought significant cuts in materials handling costs.
- Scrap salvage recovers important production dollars for United States Steel's Tennessee Coal & Iron Division. L. C. Teague, TCI purchasing agent, recently suggested a means by which significant quantities of scrap metal could be recovered from rubbish deposits for re-use. Charles W. Whitson, of the Fairfield Tin Mill, showed where jets for steam cleaning of metal could be manufactured from scrap lead and stainless steel. This has resulted in cutting the original cost and greatly increasing the useful life of the apparatus.
- · To break rock-like iron ore loose from the working face of mines beneath Birmingham's Red Mountain, miners blast the ore with explosives. Each charge for blasting must be fused and fitted with a blasting cap above ground before it is transported down into the mine. W. W. Wickstrom, a TCI mine foreman, recently developed a system for central storage and preparation of explosives to serve TCI's several ore mines. This centralized system supplanted several separate preparation and storage facilities for each individual mine and brought about some important cost-cutting.
- ♦ A change in the type of boards used as temporary timbering in coal mines was an economy suggested by TCI Industrial Engineer J. F. Leonard. Another was the suggestion by Key Draftsman C. C. Hancock to change materials used for forms in pouring concrete foundation piers. Both suggestions raised efficiency and cut costs for TCI's mining and construction operations.

#### Grease for High Temperature

plant in Shreveport, La. has three exhaust fan motors operating at 1725 rpm. Bearing temperatures on these motors are in the range of 550 F. At these temperatures ordinary organic greases thin out, decompose . . . lose their effectiveness. As a result, every two weeks a new set of bearings had to be installed in one of the motors at a cost of \$20 per set for bearings and 4½ hours of maintenance by three men. Every four weeks a new \$18

shaft had to be installed, as well.

This went on regularly for several years, while one high-grade organic grease after another was tried and discarded.

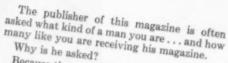
Then in the spring of 1951, Bird & Sons tried heat resistant Dow Corning 44 silicone grease.

Maintenance and replacement costs dropped at once to a fraction of their former level. In one year, for instance, only four bearings and a single shaft were replaced. The plant has used 44 Grease exclusively for five years now, and the total saving to date is around 1700 man-hours, plus \$1,200 in bearings and shafts. And the savings continue to mount each day.

## Everybody profits $\dots because$

## you belong

in this picture!



Because the advertisers (whose money is his chief income) insist upon knowing the types of people (by industry or profession, by title) for whom the magazine is edited — and how

In order to standardize on the presentation of such information to advertisers and to have its accuracy vouched for by a disinterested third party, nearly 450 publishers have joined some 200 leading advertisers and advertising agencies in a non-profit organization called Business Publications Audit.

The purpose of BPA is to assure advertisers . . . by frequently checking and rechecking that each member publisher is indeed distributing his magazine, in the numbers promised, to the types of men he promised

The BPA symbol in this magazine means that you belong . . . that because of your occupational interests you are qualified, in the eyes of the advertisers, to receive it.

The advertiser can thus tell whether he's getting his money's worth.

The publisher has a better sales story to prospective advertisers because his magazine

And you, the reader, get more value from the magazine because both the advertisers and editors, knowing what your special occupation is and what your interests are, are better able to prepare advertising and editorial material that will be most informative and useful to you.

#### What you can do

Publishers and advertisers frequently write to magazine readers to learn what kind of articles and advertisements appeal most. Cooperate with them — will you? — by answering their questions . . . in the interest of better communications between makers and

### BUSINESS PUBLICATIONS AUDIT OF CIRCULATION, INC.

New York 17, N. Y.



A NON-PROFIT, TRIPARTITE MEMBERSHIP CORPORATION OF ADVERTISERS, ADVERTISING AGENCIES AND BUSINESS PUBLICATIONS



#### Southern News Briefs

(Continued from Page 16)



#### New Griffin Lamp Company Plant-Mississippi

The new plant of the Griffin Lamp Company. Shelby, Mississippi, is an Armco (Armco Drainage & Metal Products, Inc.) tuss-type building 100 ft wide by 220 ft long and 14 ft high. Absence of interior columns gives the company complete flexibility of interior arrangements. Functional areas can be changed at will and the building can be expanded in length or width with standard Armco steel buildings. In addition to the manufacturing area, the plant includes an air-conditioned Armco frameless building 28 ft wide and 80 ft long, which provides attractive and comfortable offices.

All cover material is Armco Aluminized steel, an aluminumcoated sheet steel that is reported to give more than three times the service of ordinary galvanized steel. By actual test, Aluminized steel also reflects up to 80% of radiant heat. This will help keep the new plant cooler in summer and easier to heat in winter. The large structure has corrugated roof panels and Steelox wall panels.

#### Skid-Mounted Mobile Substation

A mobile substation believed to be the first ever built on skids instead of wheels, is supplying power for a strip coal mine in Kentucky.

The unit was built at General Electric's Power Transformer Department at Pittsfield, Mass. for the River Queen Coal Company, Greenville, Ky.

The substation is mounted on a sled made of 24-in. steel I-beams, heavily braced and angled up at both ends for pulling by tractor. It was especially designed to provide a low center of gravity and a 24-in. clearance for pulling over rough terrain with slopes up to 30 degrees. The whole unit weighs 14½ tons and includes a forced-oil-air-cooled transformer rated 3,750 kva, 34,500 to 4160Y/2400 volts; switchgear, lightning arresters, and accessories.

It is being used at River Queen's strip mine to supply power for a 55-cubic-yard electric shovel.

Towers are erected to carry the HV lines to the sled substation, and heavy cables laid on the ground carry power from the transformer's secondary to the shovel.

#### U. S. Steel-Ala.

Clinton R. Milstead has been appointed Southeast district director of public relations of United States Steel Corporation with headquarters at Fairfield, Alabama.

Mr. Milstead succeeds Stephen T. McGinnis, who is retiring after 20 years with U. S. Steel's Public Relations Department.

A graduate of the University of Alabama with an A.B. degree in Journalism, Mr. Milstead joined U. S. Steel in 1952 as field representative in the Public Relations Department in Fairfield. Since June 1, 1954, he has been assistant district director in the same office.

#### Hevi-Duty Elec. Co. Names Rogers & Assoc. in Southeast

C. B. Rogers & Associates, 1000 Peachtree St., N.E., Atlanta 9, Ga., now represent the Hevi-Duty Electric Company, manufacturers of electric heat treating furnaces. The Rogers organization will serve industrial plants in Alabama, Florida, Georgia and South Carolina.

#### Alco-Virginia

Dr. J. L. Meem, Jr., chief reactor scientist for Alco Products, Inc. during the period in which the company built the Army Package Power Reactor, has become professor of nuclear engineering and director of the reactor facility at the University of Virginia.

He will continue to be associated with Alco as a consultant on the company's activities in the nuclear power field.

In his work at Charlottesville, Va., Dr. Meem will be in charge of a "swimming pool" reactor similar to a research installation he supervised earlier in his career at the Oak Ridge National Laboratory.

#### Tulane Univ. Fund-SW

Gerald L. Andrus, vice president of New Orleans Public Service, Inc.,



has been named chairman of the newly organized corporations division of Tulane University's Fund, according to H. Grady Meador, fund chairman.

Dr. Robert W. French, director of the port of New Orleans and former vice president of the University, and William B. Wisdom, New Orleans advertising executive, will serve as vice chairmen.

Andrus and his committee will take the Tulane story to national corporations as a phase of the annual effort of the university's Development Council to supplement income from endowment and tuition. Goal for the council's 1957-58 campaign is \$1,150,000.

New Orleans and South Central business firms and corporations have responded generously to Tulane's appeal in recent years, and it is expected that the new division headed by Andrus will result in a further broadening of the base of support.

#### Delta Tank-La.

Appointment of Robert S. Gaudin as a sales engineer in Delta Tank Manufacturing Co., Inc.'s Oilfield Equipment Division has been announced by Ross B. Baze, vice president.

Mr. Gaudin has been assigned to Delta's Lafayette, La. branch.

A graduate of Louisiana State University, Mr. Gaudin formerly was active in the production department of Humble Oil Company and Warren Petroleum Company.

#### Southeastern Repr. for Miniature Precision Bearings

The George W. Smith Company of Atlanta, Ga., is now exclusive representative of Miniature Precision Bearings. Inc. in Florida, Alabama, Georgia, Tennessee and eastern Mississippi. MPB manufactures more than 500 types and sizes of miniature ball bearings of extremely close tolerances for aviation instruments, missile components, and electronic components.

#### Petroleum Chemicals-La.

Largest single order for gas turbines for use in this nation's petrochemical industry has been placed by The Lummus Company for Petroleum Chemicals, Inc. with General Electric Company's Gas Turbine Department.

The order, amounting to over \$2,000,000, is for two gas turbines rated 13,000 hp and one rated 12,150 hp. They will be installed in the chemical firm's new multi-million dollar installation at Lake Charles.

The three gas turbines will be used to drive eight compressors for the PCI's ethylene production plant which ultimately will produce over 300,000,000 pounds of ethylene per year. One of the 13,000 hp units will drive four compressors in tandem, while the other similarly rated machine will drive one compressor. The 12,150 hp gas turbine will operate three compressors simultaneously.

Exhaust from all three gas turbines will pass through heat recovery boilers to produce process steam for the installation.

All three of the gas turbines are of General Electric's simple-cycle, single-shaft design and will burn natural gas as a fuel.



#### How to get more storage space with BLAW-KNOX Electroforged Steel Grating

You can get additional badly needed storage space easily and economically in your present building simply by installing platforms of Blaw-Knox Grating. It fits easily, neatly around pipes, beams and machinery without any alterations to your building.

Maintenance costs are slashed in the bargain. There's nothing to wear, nothing to patch. Blaw-Knox grating is self-cleaning too. No sharp corners to clog up with dirt, and you'll find painting is easy since all surfaces are easily accessible.

You get maximum open area for plenty of light and ventilation. What's more, its rigid one-piece construction means maximum struc-

tural strength and load bearing capacity.

Blaw-Knox Electroforged Grating for walkways, stair treads and floors is fabricated to your specifications to meet your own operating requirements. Complete data on all types is contained in Bulletin 2527. Write for your copy today.

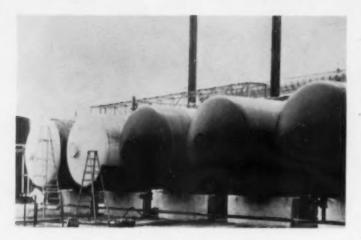


#### BLAW-KNOX COMPANY



Equipment Division
Dept. K, Pittsburgh 38, Pa.

#### News for the South & Southwest (Continued)



## Vinyl Protective Coating System in Lake Charles Chemical Plant

A vinyl coating system for chemical storage tanks has lasted more than three times as long as conventional corrosion - resistant coatings under severe atmospheric conditions.

Davison Chemical Company, Division of W. R. Grace & Co., painted six 33,000-gallon ammonium hydroxide storage tanks at its Lake Charles. La., plant with Amercoat No. 33, a coating based on Bakelite vinyl resins to give utmost protection. This coating, formulated by Amercoat Corporation, South Gate, Calif., has given successful service on these tanks for more than three years. Two systems of coatings used previously failed in a year or less.

Coatings based on Bakelite vinyl resins show excellent resistance to acids, alkalies, oils, weathering and abrasion. They are also resistant to cracking and chipping. The inherent flexibility of the coatings allows for expansion and contraction of the metal tanks as temperature changes.

The tanks, which are 10½ ft in diameter and 53 ft long, were first sandblasted for proper preparation of the surface. A white top coat was used to reflect the sun's rays and to minimize vaporization of ammonia in the storage tanks. The first coat was applied by brush and three additional spray coats were applied to give a total film thickness of .006 to .008 of an inch. Extra coats were applied to welds, corners and rough areas to make sure of thorough coverage.

Since vinyl-base coatings require a relatively short time for application, downtime for equipment is held to a minimum. Additional savings are possible because the coatings require little maintenance.

### Richmond Headquarters for Robertshaw — Fulton Controls

The Executive Offices of Robertshaw-Fulton Controls Company are now located on the top floor of the Life Insurance Company of Virginia Building, 911 East Broad St., Richmond 19, Virginia. Headquarters of John A. Robertshaw, Chairman of the Board of Directors and the Company's international operations, under John A. Robertshaw, Jr., Vice President, remain in Greensburg, Pa.

#### "Automatic" Sprinkler — Jacksonville

A sales office in Jacksonville, Florida, has been opened by the "Automatic" Sprinkler Corporation of America. Located in the Ames Building at 2721 Park Street, the office will be headed by R. A. Sheffield.

"Automatic" Sprinkler Corporation designs, manufactures, and installs permanent piping fire protection systems, and fire protection devices and system components.

#### Steam for Research Center; Thompson Products — Virginia

The Babcock & Wilcox Company has announced that it will furnish the boiler and related generating equipment at the Research & Development Center being built by Thompson Products, Inc. on a 1050 acre site approximately 20 miles south of Roanoke, Va.

The Center will use the steam generated by the B&W equipment exclusively for conducting research projects, including the testing of components for missile system experiments with monopropellant and bipropellant fuels. To simulate conditions at actual operational altitudes of the missile, steam supplied by the B&W boiler will be used to operate the steam ejectors which exhaust both the turbine discharge and the experimental test chamber. steam will also be used as a heat source for preliminary heating to temperatures of 300 F.

Approximating closely a standard Babcock & Wilcox shop-assembled steam generator, the boiler has a design pressure of 300 psi, and will deliver saturated steam at 275 psi. Its normal capacity will be 40,000 lb/hr. Because of the unusually heavy contamination of the process steam due to entrained products of decomposition and combustion, condensate will not be returned to the boiler. Thus, 100% of the ejector steam when condensed will be discharged to the sewer.

B&W has utilized an outdoor design of the unit for a semi-outdoor installation. About one foot of the front of the boiler will project into the enclosed boiler room to allow indoor control. This arrangement will save Thompson Products, Inc. both construction space and cost.

#### Pfaudler Permutit, Inc.

The Pfaudler Co., of Rochester, N. Y. and The Permutit Company of New York City have merged under the name of Pfaudler Permutit. Inc.

The new organization brings together the world's largest manufacturer of industrial glassed steel processing equipment and the pioneer and largest producer of water conditioning equipment and ion exchangers and power plant accessories. The new company will now participate in the huge market for pollution control and industrial treatment of waste water.

#### Texas Eastern-La.

La Gloria Oil and Gas Company, recently acquired by Texas Eastern Transmission Corporation, will be operated as a subsidiary with the same management and personnel.

#### Parker-Va.

Appointment of Industrial Bearings Co., 137 East Olney Road, Norfolk, Virginia, as distributor of Parker synthetic rubber o-rings for sealing applications has been announced by D. A. Cameron, general sales manager of Parker Appliance Company, Cleveland, Ohio.

E. W. Alley, manager of the new distributor, states that extensive stocks of o-rings will be carried to assure prompt handling of customer needs in the Norfolk area. Technical assistance to the distributor as needed will be available from R. B. Jewett. Parker district manager with headquarters in Philadelphia.

### Reynolds Now V.P.—Mfgr. for Gulf States Paper

W. G. Reynolds is now vice president for manufacturing of the Gulf



States Paper Corporation and will be responsible for the operation of the company's installations at Tuscaloosa and Demopolis, Alabama. He has held the positions of manufacturing manager, assistant to the executive vice president, production manager and assistant production manager.

#### Clark Bros.-Atlanta

Clark Bros. Co., Division of Dresser Operations, Inc. have moved their Atlanta District sales office from 3092 Maple Drive, N.E. to 3166 Maple Drive, N.E., Atlanta 5, Georgia. Richard Foster is District Manager.







#### L. B. Foster-Houston

Ralph E. Hickey and James R. Foster have been appointed sales en-

gineers for the Houston, Texas office of L. B. Foster Company. E. G. Giles has been made assistant manager of the order and traffic department.

#### Greensboro Office for Kirk Cousart and Assoc.

Kirk Cousart and Associates. manufacturers representatives with Home Offices in Charlotte, N. C., have opened an office in Greensboro, N. C. W. S. Mitchell has been named manager of the new office which will be located in the Waynick Building, 1882 Pembroke Road. He formerly was manager of the firm's Durham, N. C., office.

Kirk Cousart & Associates are representatives for American Air Filter Company's air filter, dust control, and engine and compressor products

AAF's unit ventilator and heating and ventilating accounts in the Greensboro area will continue to be handled by Richard K. Hunter and Company, Greensboro.

#### Plibrico - Atlanta

Plibrico Company, offering refractory engineering and construction for boilers, incinerators and industrial furnaces, has announced the appointment of John H. Kolstad to the Atlanta office—Plibrico Sales & Service Co., 1000 Peachtree St., Atlanta 9, Georgia. Warehouse stocks of Plibrico refractory products are located at 550 Glenn St., Atlanta.

#### Jeffrey Mfg. — West Va.

The Jeffrey Manufacturing Company has announced the appointment of George Kepley as District Manager, Industrial Division, of the Beckley, West Virginia office. Kepley came to Jeffrey in 1946 and has been associated with the Pittsburgh office since May 1954. He replaces James Burke who has resigned.

#### Aluminum Jacketing Distrib. Expanded by Aseeco, Inc.

A long-range plan for achievement of national distribution for Aseeco Aluminum jacketing is progressing "much more rapidly" than originally anticipated and the company now has 32 distributors providing marketing coverage in 40 states and Alaska, it has been announced by Ed Tracey, general sales manager for Aseeco, Inc., division of Associated Engineering & Equipment Co., Inc., Houston.

The company manufactures aluminum jacketing for insulated lines, towers, tanks and vessels. It is available either cross-corrugated or plain, with or without factory-attached moisture barrier backing. The jacketing may be obtained in .006 gauge in rolls 48 in. wide or in .016 or .020 gauge in rolls 36 in. in width. In general, the lighter weight jacketing is used for insulated lines while the heavier weights are employed as a covering for insulated tanks, towers or vessels.

Aseeco, Inc., was organized in October, 1956. Initially, sales efforts were concentrated in the South and Southwest with particular emphasis on the oil and petrochemical industries where this type of insulation protection attained its first strong acceptance.

Southern and Southwestern distributors of Aseeco Aluminum Jacketing include: Insulation Engineers at Mobile, Alabama; North Brothers at Birmingham, Orlando, Savannah, Columbia, and Knoxville; General Insulation & Roofing Co. of Louisville; Kansas City Insulation Services of Tulsa; The Gilmin Company of Corpus Christi; Precision Insulation Co. of Houston; and Allied Services. Inc. of Charleston, West Virginia.



plant? Will they carry hot corrosive liquids or gases?

You will find SAFETY in DURASPUN Centrifugally Cast Pipe. It's very strong, with strength approaching that of forged steel. It can be alloyed to give you maximum resistance to the heat and corrosion to be

## it's alloyed to resist corrosion and high temperature

DURASPUN Pipe comes in a wide range, as follows:

Outside Diameter	Minimum Wall	Length
21/2" to 3"	1/4"	88" maximum
3" to 6" Inclusive	5/16"	110" maximum
Over 6" to 12" Inclusive	3/8"	168" maximum, 24" minimum
Over 12" to 14" Inclusive	7/16"	168" maximum, 24" minimum
Over 14" to 20" Inclusive	1/2"	180" maximum, 48" minimum
Over 20" to 24" Inclusive	1/2"	88" maximum
Over 24" to 32" Inclusive	5/8"	80" maximum

This is standard piping. Special cylindrical shapes in comparable high alloy steel can be cast centrifugally . . . retorts, furnaces, fractionaters and other such equipment come in this class.

Write us about your requirements. Our metallurgists backed by thirty-five years of experience will be glad to help select the best combination of alloying elements to take care of your operating conditions.



ATLANTA OFFICE: 76-4th Street, N.W.

CHICAGO OFFICE: 332 South Michigan Avenue

DETROIT OFFICE: 23906 Woodward Avenue, Pleasant Ridge, Mich.

For more information, use Reply Card-Page 89

#### News (Continued)



#### Six Synchronous Motors **Drive Condenser Pumps**

Photo shows the first of six Electric Machinery Mfg. Co. motors (1250 hp, 360 rpm, 95.3% efficiency) to be installed for the City of Memphis Power and Light Company. Motors will drive condenser pumps.

Manufacturer believes this is one of the first installations to use synchronous motors of this size for condenser pump drives. Lower first cost and higher efficiency are two of the big advantages.

#### Niagara Machine-Southwest

The Blackman & Neutzel Machinery Company, 3713 Washington Blvd., St. Louis 8, Mo. (with a branch office in Kansas City, Mo.) is now distributor in Arkansas and all of Kansas, except southernmost counties, of Niagara Machine & Tool Works' line of presses, press brakes, shears and related machines and tools.

#### **BullDog Electric** — St. Louis

BullDog Electric Products Company has announced the appointment of Lloyd G. Driy as a Field Engineer to its St. Louis District Office. He will work under the direct supervision of E. N. Cahoon, St. Louis District Manager.

Prior to joining BullDog, Driy was associated with the Emerson Electric Company of St. Louis for ten years. He served them in the capacities of Southern District Sales Representative and Air Conditioning Service Manager.

#### Commercial Shearing—SW

Opening of a Southwestern Regional Sales Office has been announced by Commercial Shearing and Stamping Company. Youngstown, Ohio. Located in the Exchange Bank Building, Dallas, the office will serve Mississippi, Louisiana, Oklahoma, and Western Tennessee in addition to Texas.

Charles J. Butler has been named as manager of the sales area. He was previously with Commercial's General Sales Department in Youngstown.

Commercial has metalworking plants in Youngstown, Salt Lake City and Chicago to produce custom stampings, forgings, and weldments, including specialized construction and building products. The company also manufactures oil-hydraulic fluid power controls, including pumps, valves, and cylinders.

#### New Mississippi Refinery

When completed in October, the 11,000 barrels per day \$20 million Pontiac Eastern Corporation refinery at Purvis, Mississippi will be the largest in the state. Refinery is being engineered and constructed by The Fluor Corporation, Ltd.

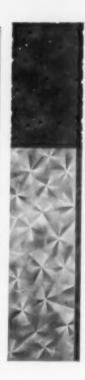
#### Andrew Rose Elected Byron Jackson V.P.

Andrew W. Rose has been elected Vice President and Assistant to the President of the Byron Jackson Division of Borg-Warner Corporation.

Mr. Rose has been Vice President and General Manager of the Petro-Mechanics Research Division, the Borg-Warner laboratory at North Hollywood, California, which is developing the sonic oil well drill. Prior to heading Petro-Mechanics operations he was Pacific Coast representative for Borg-Warner. Mr. Rose has been a member of the Supervisory Board of Byron Jackson since the company merged with Borg-Warner in 1955.

#### Fisher-Pierce - Southwest

L. R. Ward Company, with offices in Dallas and Houston, are representatives of The Fisher-Pierce Company. F-P photoelectric lighting control sales will be handled by Ward in Oklahoma and the Amarillo and Panhandle sections of Texas.



# HOT-DIP GALVANIZING by

## DIXISTEEL

### adds years of life to Iron or Steel

Nothing protects iron and steel from rust better than zinc. And nothing applies zinc better than hot-dip galvanizing.

Our modern equipment assures small, tight spangles...smooth, uniformly heavy coats of zinc...no burrs or fins! A tough, long-lasting barrier against rust and corrosion.

Call, write or wire for prices and information.

## ONE OF THE SOUTH'S LARGEST HOT-DIP GALVANIZING TANKS



P.O. Box 1714 . ATLANTA 1, GEORGIA . TRinity 5-3441



## **NEW Catalogs & Bulletins**

#### STEAM TURBINES . . . FURNACES BOILERS, STOKERS, BURNERS

2—Water Tube Boilers—Shop-assembled "package" gas-oil or combination fired units described in 8 page brochure. Pressures to 600 psig; 1,000 to 20,000 lb/hr—design features, installations. — VULCAN STEEL TANK CORP.

3—Boiler Seam Protector—Catalogue sheet describes and illustrates why H.R.T. boilers need refractory seam protection. — NATIONAL BOILER PROTECTOR CO.

9—Free Coal Counseling — General information on how Coal Bureau engineers will advise on selection, transportation and utilization of the right coal for your purpose.—NOR-FOLK AND WESTERN RAILWAY.

12—Steam Turbines — Advances in design of double and triple-flow tandem ratings to 250 mw, and of 3600/3600 rpm and 3600/1800 rpm close-coupled cross-compounded arrangements to 500 mw and larger, described in Catalog 03R8620. — Power Equip. Div., ALLIS-CHALMERS.

14—Generator Installations — Bulletin GB-1 shows how installations of Amesteam Generators have solved boiler room problems for their owners. Photos illustrate units from 10 through 600 hp for firing combinations of oils and gases. — AMES IRON WORKS, INC.

17—Unit Steam Generators—Bulletin 2000 describes units operating under a negative pressure, with induced draft fan completely purging the entire pressure vessel of any stray raw gases before and after firing. Have tube sheet protective device and precipitator for cleaner operation.—PREFERRED UTILITIES MFG. CORP.

23—Soot Blowers—Bulletin 1030 describes Vulcan T-30 retractable soot blowers, available in lengths up to 38 ft. Includes sectional drawings and special design features.—COPES-VULCAN DIVISION.

35 — Unit Steam Boilers — Catalog AD-100 — Gives complete information on oil and gas fired "Self Contained" boilers, 15 to 500 hp, 15 to 250 psi for processing and for heating. Gives features, applications, efficiencies, capacities and dimensions.—CLEAVER-BROOKS CO.

48—Boiler Tubes—Booklet gives information on care of boiler tubes, causes of chemical attack, etc. Contains charts of weights, working pressures, etc. for boiler tubes and pipe. — BOILER TUBE COMPANY OF AMERICA.

51—Packaged Water Tube Boilers—Complete data and dimensions for boilers ranging from 8,000 to 50,000 lb/hr, firing oil or gas or both, described in 12 p Catalog 111-D.—SUPERIOR COMBUSTION INDUSTRIES, INC.

83—Steam & Hot Water Generators — Booklet describes company's line of fifteen compact models from 18 to 500 hp (15 to 200 psi). Only five connections needed; no special foundation.—CYCLOTHERM DIVI-SION.

87—Steam Turbines—Single Stage—Bulletin 500 describes features and characteristics of company's type DH steam turbines in horizontal and vertical models. — DEAN HILL PUMP COMPANY, INC.

96—Packaged Gas Burner — Nonpremixing ring gas burner incorporates flame retention regardless of air velocity. Factory assembled forced draft Series H packaged units for gas, rotary oil or combination described in Series B13 literature. — THE WEBSTER ENGINEERING COMPANY.

#### FANS—PUMPS—COMPRESSORS HEATERS—HEAT EXCHANGERS

tin 1.1K5 describes exchangers widely used on engines, compressors and other machinery for cooling lube oil, jacket water, air and gas. Compact, standardized units in wide range of sizes.—ROSS HEAT EXCHANGER.

108—Active Air—Catalog 2046 shows how to put active air to work in buildings and shops. Direct drive exhaust fans, air circulators, and ceiling fans. — EMERSON-ELECTRIC.

110 — Deaerator — Publ. 4651 describes design that eliminates tubular vent condensers without impairing efficient purging of noncondensible gases. Unit handles wide range of operating conditions. — COCHRANE CORPORATION.

112 — "Packaged" Fans — Catalog 515 shows how Clarage V-belt Ready Units economically answer your smaller air handling requirements, 18 sizes, wheel diameters 9% to 32½", capacities to 12,000 cfm. Direct connected units also available. —CLARAGE FAN CO.

113—Industrial Service Pumps — 16 page Bulletin B-505 describes standard, heavy-duty and special service types offering vertical versatility in pumping liquids from short settings. Capacities: 30 gpm to 40,000 gpm; heads up to 1000 ft. Electric drive up to 2500 hp. — PEERLESS PUMP DIVISION.

#### Note Your NEW Reader SERVICE on Advertisements



126—Centrifugal Pumps — Bulletin 7248A covers new DMV-DHV single-stage line for general hydraulic service; double mechanical shaft seals eliminate stuffing box maintenance; sizes from 3 to 6 in. with heads to 350 ft & capacities from 250 to 2400 gpm. — INGER-SOLL-RAND.

128—How to Solve Pumping Problems—Booklet, 36 pages — Explains the functions and characteristics of Rotary gear pumps; sample application problems with charts and curves on pipe friction losses, viscosity conversion tables, materials of construction for various liquids, and additional information pertaining to pump applications.—GEO. D. ROPER CORPORATION.

129—Portable Compressor—Bulletin 2307 describes Gyro-Flo 85, an oil-cooled, single-stage rotary sliding vane compressor, the lightest portable ever devloped. — INGERSOLL-RAND CO.

"CR" radial wheel draft fans for stoker fired or pulverized coal boilers described in Bul. FD 205. Also handles air with dust loadings in wide range of industrial jobs. — BUFFALO FORGE COMPANY.

143 Chemical Feeders—36 p Bul.
1136 describes metering pumps
— types, construction, displacement
and operating pressures. Gives handling recommendations for chemicals, acids, etc., and volumetric conversion tables.—MANZEL.

Catalog No. H-1 includes photos, dimension drawing, selection tables, and operating data on "NCR" Single and "NCRD" duplex condensate return pumps, especially designed for low pressure steam heating systems and which handle condensate up to 200 F.—C. H. WHEELER MFG. CO.

165 — After-Cooler — Bulletin 130 shows how the Aero unit re-

## FREE Reader SERVICE Use These Handy Return Cards

- Circle Code Numbers of Catalogs You Want
- Circle New Equipment Code Numbers You Want to Know More About
- Fill in Co. Name and Page No. of Ads
- Print Your Name,
   Position and Company
- Tear Out and Mail Today! No Postage Necessary

Please be sure to fill in your Firm's Name and your position on the Coupon. moves moisture from compressed air or gases; "cools water for jackets and intercoolers; cools air or gases in both power and process systems; and protects air tools and pneumatic systems from water damage.—NIAGARA BLOWER COMPANY.

#### INSTRUMENTS-METERS CONTROLS-REGULATORS

operation and application manual GEA-6372 explains what each product is, shows how product works and tells where devices can be applied. Covers manual, magnetic and reduced-voltage starters; push buttons; relays; limit switches; solenoids; pressure and vacuum, float and plugging & anti-plugging switches. — GENERAL ELECTRIC COMPANY.

209—Liquid Level Controls—Catalog describes controls for almost any liquid, at any pressure, at any temperature. Can be furnished in topmounting, side-mounting styles, or as external float cage units. Almost unlimited application. — MAGNETROL, INC.

211—Fluid Control Valve — Bulletin CV-1 describes "Bellofram" construction where no force is lost at end of the stroke where spring compression requires maximum force. Sizes start at \%".—FOSTER ENGI-NEERING COMPANY.

225—Cooling Controls — Self-powered controls for compressors, stills, solvent coolers, degreasers, small engines, etc., described in Bulletin 710; operational and hook-up





#### BUSINESS REPLY CARD

Reader Service SOUTHERN POWER AND INDUSTRY 806 Peachtree St., N. E. Atlanta 8, Ga.



sketches.-SARCO COMPANY INC.

228—Fuel Cut-Outs & Water Level Alarms — Brochure D2 — Electrode type equipment for installation on water columns to provide fuel cut-out, high and low water level alarms and pump cut on and off. For pressures to 2500 psi. — RELIANCE GAUGE COLUMN CO.

235—Liquid Levels—Bulletin 532 describes indicator which gives a reliable, automatic reading of storage tank contents. 20" dial in 3 x 10" case saves panel space. No outside power source needed; can be located up to 250 ft from tank. — THE LIQUIDOMETER CORP.

236—Computing Relay—4 p product specification P99-3 describes fea-

tures, application, and operating characteristics of computing relay for pneumatic control systems. — BAI-LEY METER CO.

248—Pump Pressure Regulators

Bulletin 5306 describes constant
and differential pump pressure regulators for steam turbines, reciprocating and motor driven pumps. Complete sizing and capacity information as well as construction features. — LESLIE CO.

256—Boller Control—On-the-job report of Carolina Power and Light Company's Louis V. Sutton plant in Bulletin 1032. Features: combustion, feedwater, boiler feed pump re-circulation controls plus automatic sequential soot blowing.—COPES-VULCAN DIVISION.

290—Small-Size Gauges & Receivers
— Bulletin V5 covers new line
of easy-to-read gauges and receivers
which save panel space, make more
compact groupings and still get accuracy and dependability. Five inch
illuminated scales; multiple or individual mounting — draft, pressure
and vacuum, differential pressure,
temperature. — REPUBLIC FLOW
METERS CO.

297—Remote Signal Alarms—Bulletin WG-1824 describes how lights on horns, operated by indicator control unit give instant warning of any serious deviation from normal boiler water level.—YARNALL-WARING COMPANY.

#### PLANT EQUIPMENT—WELDING TOOLS—PROCESS SPECIALTIES

301 — Metal Fabrication — Replacement parts for plant maintenance; Sheet, plate & light structural. Brochure describes engineering services for Southern industry. — ENGINEERING SALES.

312—Low Temperature Welding — Wall chart TIS 2616 lists torch and arc welding applications for all metal-working jobs. Enables the welder to adopt the best alloys and procedures for repairs. Helps stock clerks and purchasing agents concerned with welding alloy selection. — EUTECTIC WELDING ALLOYS CORPORATION.

discusses your plate fabrication problems and shows how company custom-fabricates hot water storage heaters, tanks, air receivers, blow-off tanks, etc. Corrosion resistant linings and materials featured. Suggested specifications and other valuable technical data given. — J. J. FINNIGAN CO.

317—Drier Compressed Air—Bulletin 130 shows how Aero After Cooler cools compressed air or gas below temperature of surrounding atmosphere; no further condensation

## FREE Reader SERVICE Use These Handy Return Cards

 Tear Out and Mail Today! No Postage Necessary

SPI REA	DER SERV	ICE:						HOVEMBI	R, 1957
Send me	FREE liter	rature cir	cled						
2 83 129 235 319 438 576 696 802 879	3 87 134 236 336 467 584 705 803	9 96 143 248 367 470 595 706 811	12 101 162 256 386 471 619 710 816	14 108 165 290 392 500 620 713 821	17 110 202 297 401 507 624 721	23 112 209 301 407 513 629 722 838	35 113 211 312 409 519 632 754 842	48 126 225 315 417 529 656 755 860	51 128 228 317 418 536 691 774 874
Send me	FREE info	rmation o	n new eq	uipment cir	cled				
L-1 L-9 L-17	L-2 L-10 L-18		-3 -11	L-12	L-5 L-13	L-1		L-7 L-15	L-8 L-16
Send me	FREE info	rmation o	n these o	ds					
Company	y		Page		Compa	ny		Pog	
Compan	y	Page		Company		Page			
Name .				*******	,	Posi	ition		
Company	y Name		******		*******			********	
Street .					*******			********	
						~		ite	





BUSINESS REPLY CARD

Reader Service SOUTHERN POWER AND INDUSTRY 806 Peachtree St., N. E. Atlanta 8, Ga.



in your air lines. Installed outdoors. Saves cooling water. Gives better operation of air-operated tools, etc.

NIAGARA BLOWER COMPANY.

319—Portable Band Saw — Bulletin describes the Kalamobile, a portable metal-cutting band saw. Has rubber-tired 12" wheels and telescoping handles. Capacity 6" rounds—10" flat.—Machine Tool Div., KAL-AMAZOO TANK AND SILO CO.

356—Retaining Walls—Catalog RW
3555 shows how bin-type walls
stabilize slopes and gain valuable
ground for buildings, parking areas;
all-metal cellular construction; allbolted assembly means small crews
can do the job.—ARMCO DRAINAGE & METAL PRODUCTS, INC.

367—Industrial Track—How you can save with relaying rails outlined in Catalogs RT-9. Covers switch material and accessories. — L. B. FOS-TER CO.

386—Rigid Frame Buildings—8 page bulletin "Dixisteel Rigid Frame Buildings"—low cost, flexibility of design, durability, and minimum anintenance; also triangular or bow-string truss all-steel roof systems; fabricated for rapid erection.—ATLANTIC STEEL COMPANY.

392—Metal Cutters — Catalog describes three heavy duty units for cutting almost anything in metal up to %"—rods, wire, chain, etc.—H. K. PORTER, INC.

#### PIPING, VALVES, FITTINGS STEAM SPECIALTIES, TRAPS

401—Underground Pipe Insulation— 4 p brochure L-102-F-56 discusses problems of underground pipe insulation and explains how Gilsulates' special properties overcome them. On-the-job photos illustrate ease and speed of application. Thermal coefficients of transmission and other technical data and specifications are given. — AMERICAN GILSONITE COMPANY.

407—Piping Materials—Bulletin reports on intensive investigation into problem of main steam piping materials and gives data on stress rupture characteristics of Types 316 and 347 stainless steel piping adjacent to welded joints. — PITTS-BURGH PIPING AND EQUIPMENT COMPANY.

409—Lubricated Plug Valves—Catalog PV-4 covers operational features. Quarter-turn to open or close; lubricant grooves provide positive seal when valve is closed; when open, seating surfaces not exposed.—THE WM. POWELL COMPANY.

417—Welding Fittings—192 page Cat.

54 gives design data on piping and piping application, including digests of specifications, working pressures, design formulas, etc. Covers welding fittings, prefabricated pipe, forged steel flanges, and pipe coils. — MIDWEST PIPING COMPANY INC

418—Diaphragm Control Valves — Complete facts on company's %" to 6" valve line given in Bulletin CV53. Design features large flow coefficient.—KEILEY & MUELLER, INC.

438—Steam Traps — 4 p Bulletin T-1746 (57) illustrates and describes Series 40 high capacity impulse steam traps. Includes capacities, dimensions, weights, and prices. — YARNALL-WARING CO.

467—Valve Selecting Guide—Revised edition of Circular 555 (A.I.A. File No. 34) gives tables, technical data and general information on selection of valves, boiler mountings and lubricating devices. — THE LUNKENHEIMER CO.

## USE SPI READER SERVICE

470—Aluminum Jacketing — Applicable for protecting lines, tanks, towers, or vessels. Booklet shows simplified inexpensive applications in process industries, commercial buildings, etc. — ASEECO, INC.

471—Steel Pipe—1/2" thru 30" spiral weld, electric weld, butt weld, seamless, lap weld, and continuous pipe described in Catalog PL-9. Warehouse stocks in South & Southwest.— L. B. FOSTER CO.

#### MAINTENANCE PACKING GASKETS, LUBRICATION

500—Liquid Separator Filter—Catalog describes Fram Space-Saver Units for removing water from liquid hydrocarbons by filtration. Units engineered for easy installation and maintenance and are designed for a wide variety of applications—up to 69 gpm.—WARNER LEWIS COMPANY.

507—Power Sweepers — Folder describes the "704," a compact unit for small plant budgets; designed for congested areas and narrow aisles; gasoline, LP gas or battery powered. WAYNE MANUFACTURING COMPANY.

513-Conveyor Belt Repairs - Bulletin R-700 and Folder R-4 de-

scribe the "Rema" method of making vulcanized repairs without heat. Holes, gouges, rips and tears can be repaired on the job. Curing time delay is eliminated. Belts can be put into service immediately after repair is made.—FLEXIBLE STEEL LACING COMPANY.

518—Sealing Compound—Data sheet describes Tite Seal for leakproof, pressure-tight connections. Gasket and joint compound heat and vibration proof. Prevents rust and corrosion. — RADIATOR SPECIALTY CO.

528—Valve Maintenance—Folder describes the Dexter power-driven, one-man operated valve-in-line reseater. Average grinding time 4 min. Grinding heads for all angles; sizes ¼" thru 12"—THE LEAVITT MACHINE COMPANY.

536—Rod and Shaft Packings — Bulletin A-131, 8 pages—Describes Garlock patented "lattice braid" rod and shaft packings; discusses construction features, materials available, sizes, forms and service reports from users in various industries.—THE GARLOCK PACKING CO.

576—Mechanical Sealing — Catalog 480, a valuable reference book for maintenance engineers illustrates types of Dura Seals for specific temperature, pressure and fluid conditions. — DURAMETALLIC COR-PORATION.

584—Zinc Coatings — Bulletin describes Galvanox, a special zinc coating applied as a paint to provide galvanic protection to metals. — SUBOX, INC.

595—Plant Lubrication — The Lubriplate Service Handbook —
Gives valuable information on the subject of lubrication in all its forms, intended to be of everyday use to plant superintendents, managers, maintenance engineers and those in charge of plant production and maintenance. — LUBRIPLATE DIVISION, FISKE BROTHERS REFINING CO.

## ENGINES, DRIVES POWER TRANSMISSION MATERIALS HANDLING

619—Automatic Coal Scales—Bulletin 0352A covers Model H-39 (capacities up to 40 tons/hr) automatic coal scales. Coal never arches in feeder or weighing hopper—dust sealed; contact platework of stainless steel.—RICHARDSON SCALE COMPANY.

620—Roller Chains & Sprockets — 68 page Catalog 757 gives charts & tables on How to Select Roller Chain Drives, Speed Ratios for Sprocket Combinations; Horsepower YOU GET <u>more</u>\* WHEN YOU BUY BEARINGS FROM

YOUR Bunting.
DISTRIBUTOR

# more responsibility

Never written in any specifications, the responsibility of the supplier is established only by his record of service. It is well known that Bunting goes far beyond the strict terms of a transaction to meet all the requirements of the customer, even in crises produced by unforeseen and unavoidable complications. Complete manufacturing

facilities, an unfailing supply of Bunting Cast Bronze and Bunting Sintered Powdered Oil-filled Bronze Stock Bearings and Bars assure that Bunting distributors always have ample stocks.

Your Bunting distributor is listed in the classified section of your telephone directory usually under Bars—Bronze, and Bearings—Branze. Two modern Bunting factories and eleven Bunting Branch Warehouses expedite distribution in all areas. Write, or ask for catalogs giving complete dimensional listings and technical data.

Sensible price brackets making ordering and pricing easy an exclusive Bunting feature.



BUSHINGS, BEARINGS, BARS AND SPECIAL PARTS OF CAST BRONZE AND POWDERED METAL.

The Bunting Brass and Branze Company • Toledo 1, Ohio • Branches in Principal Cities

#### **Bulletins (Cont'd)**

Ratings & Lubrication Requirements. — DIAMOND CHAIN COM-PANY.

624—Freight Elevators—Booklet A-414 describes the new Plunger Electric Freight Elevator designed for low-rise, light and heavy duty freight handling requirements.— OTIS ELEVATOR COMPANY.

629—Longer V-Belt Life — 12 page Bulletin 20X6234C describes various types of V-belts and tells how to select and match them. Lists seven steps for correct installation and hints for making them last longer.—ALLIS-CHALMERS MFG. CO.

632—Gearmotors & Package Drives
—8 p booklet DB-3650 illustrates
horizontal, vertical, right angle, open,
enclosed, explosion-proof, a-c & d-c
units with respective reduction
ratios and output speeds. Speed
range from 7.5 to 780 rpm. — WESTINGHOUSE ELECTRIC CORP.

outlines three styles of speed reduction — integral gear motors speed reducers with separate motors, and speed reducers alone. Highlights all the important engineering advantages of Sterling drives and contains important information for consideration when selecting speed reducers. — STERLING ELECTRIC MOTORS, INC.

691—Tug-Bar—Data sheet describes low-cost answer to load-handling in cramped areas. Weighs only 110 lb; handles loads up to 4,000 lb; motor driven wheels do the work.— WESTERN GEAR CORPORATION.

696—Belt Manlifts—Catalog 5A-156 describes 3 sizes of belt-type manlifts for simultaneous traffic in both directions for plant personnel. Comply with A.S.S. Code requirements. — J. B. EHRSAM & SONS MFG. CO.

WATER TREATMENT, HEATING VENTILATING, AIR CONDITIONING REFRIGERATION, DUST & FUME CONTROL

705—Test Your Tower—Bulletin offers simple, proved method by which you can determine how closely your actual tower performance measures up to specified performance. Particular applicable to operations geared to temperature of process cooling water. — THE MARLEY COMPANY.

706—Automatic Roof Cooling—Bulletin shows how automatic evaporative roof cooling can reduce inside temperature 8 to 15° without air conditioning; increase roof life; and reduce fire hazards. Many Southern installations. — APRIL SHOW-ERS—SOUTHERN.

710—Scale Remover—Bulletin shows how Anco Scale Remover quickly eliminates scale in boilers, water lines, refrigeration and air conditioning systems.—ANDERSON CHEMI-CAL COMPANY.

713—Electric Precipitators—26 page
Bulletin 104 shows how units
meet five engineering requirements
—Positive control of gas flow; high,
uniform electrode emission; Effective
continuous cycle rapping; Simple,
rugged construction; and Safe, trouble-free high voltage equipment.
Gives 9 time-tested steps to a successful installation.—BUELL ENGINEERING COMPANY.

721—What Type Collector?—Reprint 102 discusses control of industrial dusts and flyash and features P-D Collector Systems.—THE THER-MIX CORPORATION.

722—Packaged De-Ionizers — Bulletin PK describes complete line of de-ionizers, which produce chemically pure water at flow rates up to 1000 gph. Standardized units shipped from factory fully-assembled, eliminating complicated installation problems, and virtually eliminating service problems. Recommended for laboratory and plant production uses. — ILLINOIS WATER TREATMENT COMPANY.

## USE READER SERVICE See Service Cards

754—Power Roof Ventilators — 8 page Bulletin 3904 describes 16 sizes of up-blast type units; 21 sizes of hood type exhaust units; and 20 sizes of hood type supply units. Fan speeds and motor hp included. — AMERICAN BLOWER CORP.

755—Cooling Tower—Bulletin DVAQ describes the double-flow Aquatower for industrial services involving intermediate-gallonages. Space saving line in wood or steel structure with asbestos cement board casing, in single or multi-cell units. — THE MARLEY COMPANY.

774—Refrigerating Units — Bulletin 97-F illustrates and describes low-pressure refrigerating units. — FRICK CO.

#### ELECTRICAL

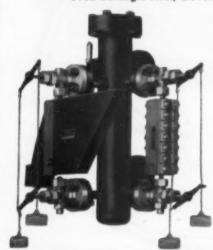
802—Small Relays—Simple solenoid design with only one moving part described in Bulletin 700. Silver alloy contacts need no cleaning,

## Reliance Boiler Safety Equipment is a profitable investment for your power plant

Don't overlook the relatively *small* equipment that keeps the *big* equipment running smoothly. Reliance Safety Devices are mainly applied to boiler water level supervision, but the wellbeing of your boilers affects other "big" equipment, as you know. So the selection of high grade accessories for the boilers is of major importance.

Water Columns and Gages are basic equipment you must add to your boiler when installed, or order with it from your boiler maker. Reliance offers you complete service in approved devices for water level supervision, including extra alarm devices that help insure attention of operators if a dangerous water level situation threatens. Reliance representatives in all major cities are ready to help you at any time.

#### The Reliance Gauge Column Company 5902 Carnegie Ave., Cleveland 3, Ohio



Water Columns for all pressures, with ar without alarms.

Water Gage Valves

Gage (try) Cocks

Gage Inserts

Direct-to-Drum
Gage Assemblies

Water Gage

EYE-HYE Remote Reading Water Level Indicator

Float-type and Electrode-type Liquid Level Alarm Devices



The name that introduced safety water columns....in 1884

Reliance

filing, or other maintenance. - ALLEN-BRADLEY CO.

803—Shielded Electrification—Bulletin KS-1 describes "Kant Shock" for monorail and crane systems. Shielding prevents accidental contact with live bus bars. Eliminates all hazards of open bar conductors, prevents costly accidents, protects employees and reduces insurance rates.

— AMERICAN MONORAIL CO.

\$11-Electric Heat-"100 Ways to

Apply Electric Heat" gives a wealth of informative data on the use of electric heat in industry — fast, uniform, dependable, backed by nation-wide engineering service. — EDWIN L. WIEGAND CO.

816—"Bus Bar" Protecting Relay—
Folder covers the TNS relay, which protects a transformer and its connected load of three-phase induction motors against outage or damage from either one or any combination of voltage unbalance, single-phasing, or motor overload, when motors are

connected thru circuit breakers having under-voltage trip. — ESCO MANUFACTURING COMPANY.

821—Electric Strip Heaters — Bulletin F1566 shows how to quickly and easily bolt or clamp Chromalox strip heaters to platens, dies, kettles, tanks, etc., for advantages obtained with electric heat.—EDWIN L. WIEGAND COMPANY.

835—Motor Starters & Contactors—
12p bulletin 14B8615 describes
sizes 4, 5 & 6 (Type 425), 50 to 400
hp. Contactors incorporate arc centering blowout, which eliminates
need for conventional blowout coils.—
ALLIS-CHALMERS MFG. CO.

838—Electric Motors — 12p brochure gives motor applications and factors in standard motor selection. Company's complete standard motor line described. — STERLING ELEC-TRIC MOTORS, INC.

842—Circuit Protection — Bulletin FIS describes the maintenance free Fusetron fuses which protect motors, solenoids, coils and transformers against burnout, and which increase production by eliminating needless blows.—BUSSMANN MFG. CO.

960—Capacitors — Correct power factor at the load. Bulletin PF-1150 describes self-contained capacitors in sizes from ½ to 15 kvar. No additional switches or fuses required.

SPRAGUE ELECTRIC COMPANY.

## USE SPI READER SERVICE

See Service Cards

Pages 89-90

874—High-Voltage Cable — Bulletin EB-27 gives full details on performance of Type AB insulation in 15 Industry Specification Tests, including operating temperature. — ANACONDA WIRE & CABLE COM-PANY.

879—Commutator Maintenance — 27 page booklet B-6150-A contains information on brush and commutator maintenance. Includes maintenance requirements, factors affecting commutation and carbon brush materials. — WESTINGHOUSE ELECTRIC CORP.



## Flame Retention RING GAS BURNER

Through a new application of an old basic principle WEBSTER now offers unequalled stability in an non-premixing ring gas burner.

> Presently packaged as Series H, Forced Draft for Gas, Rotary Oil or Combination this revolutionary development will soon be available in other variations.

Write for Series B13 literature.

Territoria Open

The

#### WEBSTER ENGINEERING

TULSA 16, OKLAHOMA

Company

Division of SURFACE COMBUSTION CORPORATION, Toledo, Ohio

#### STATEMENT

of the ownership, management and of the ownersnip, management and circulation required by the Act of Congress of August 24, 1912, as amended by the Acts of March 3, 1933, and July 2, 1946 (Title 39, United States Code Section 233) of SOUTHERN POWER AND INDUSTRY published monthly at Charlotte. TRY published monthly at Charlotte, N. C., for October 1, 1957. 1. The names and addresses of the

1. The names and addresses of the publisher, editor, managing editor, and business manager are: Publisher, W. R. C. Smith Publishing Company, Atlanta 8, Georgia; Editor, Francis C. Smith, Atlanta 8, Georgia; Managing Editor, Richard L. Priess, Atlanta 8, Georgia; Business Manager Eugene W. O'Brien, Atlanta 8, Georgia.

2. The owners are W. R. C. Smith Publishing Co.; Estate of W. R. C. Smith, Atlanta, Ga.; O. A. Sharpless, Atlanta, Ga.; J. C. Cook, Atlanta, Ga.; J. C. Cook, Atlanta, Ga.; W. J. Rooke, Atlanta, Ga.; T. W. McAllister, Windemere, Fla.; E. W. O'Brien, Atlanta, Ga.; Seba J. Jones, Atlanta, Ga.; Richard P. Smith, Atlanta, Ga.; Richard P. Smith, Atlanta, Ga.; W. C. Herbert, Atlanta, Ga.

3. The known bondholders, mortgagees and other security holders

gagees and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or any other security holders are:

4. Paragraphs 2 and 3 include, in cases where the stockholder or security holder appears upon the tacks of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting; also the statements in the two paragraphs show the affiant's full knowledge and be-lief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in capacity other than that of a bona fide owner

E. W. O'BRIEN, Business Mgr. Sworn to and subscribed before me this 27th day of September, 1957.

SEBA J. JONES, Notary Public My commission expires Feb. 24, 1958.

#### **Book Reviews**

#### Strategy and Tactics in Labor Negotiations

By Edward Peters, California State Conciliation Service; Published by National Foremen's Institute, Division of Vision, Inc., 100 Garfield Ave., New London, Conn.; 256 pages; Price, \$4.50.

Manual analyzes the essential nature of industrial conflict and studies the many strategies and tactics employed by various parties in their own self-interest. Purposes to help management and labor eliminate strikes caused by miscalculations.



## This AIR-COOLED CONDENSER

produces a **Higher Vacuum** 

• Using air as the cooling medium, the Niagara Aero Vapor Condenser produces a higher vacuum than other type condensers, and with more economy of power

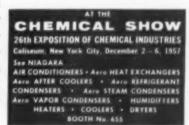
It sustains its full capacity in cooling or condensing with no more than a nominal cooling water requirement, eliminating entirely your problems of water supply and disposal.

It holds constant the liquid or vapor temperature producing always uniform products and giving maximum production.

Non-condensibles are effectively separated at the condensate outlet, with sub-cooling, after separation for higher vacuum pump efficiency.

Niagara Aero Vapor Condenser can be mounted

directly on the steel structure of your evaporator or distillation column. Its operation is dependable; its maintenance is not troublesome or expensive.



For more information write for Bulletin 129R

#### NIAGARA BLOWER COMPANY

Over 35 years of Service in Industrial Air Engineering

Dept. SP-11, 405 Lexington Ave., New York 17, N. Y.

District Engineers in Principal Cities of U. S. and Canada



## ...bend to the shape you need

Here is your quick, efficient and economical answer to hundreds of electrical heating problems. Clamp to metal surfaces, fit into machined grooves, cast into metals, immerse in liquids, install in ovens and ducts.

Versatile Chromalox Electric Tubular Heaters may be ordered in straight lengths or factory formed to nearly any shape required.

Select sheath metal and wattage to match your application and operating temperatures.

#### FREE — Send today for these 2 BIG HEATING HELPS

Catalog 50 — describes complete Chromalox line of "packaged" heaters, elements and controls. Booklet F1550 — "101

Booklet F1550 — "101 Ways to apply Electric Heat."



C-9110-A

#### Edwin L. Wiegand Company 7563 Thomas Boulevard, Pittsburgh B, Fa.



## **NEW Product Briefs**



#### Industrial Engine Analyzer

A complete cost-cutting look at the inner mechanical functioning of complex industrial engines — vithout expensive shutdowns — can be made with a new industrial engine analyzer developed by Sperry Gyroscope Company, Great Neck, New York.

The hand-portable, multi-purpose equipment displays pictorially the information formerly obtained from as many as three electronic instruments. It accurately monitors engine operation, providing data on ignition, vibration and pressure.

Four quickly-made connections to the engine are required — to the flywheel, ignition primary circuit, and two to a power cylinder. Timing the analyzer to the engine is accomplished by a fifth pickup located near a mark on the flywheel. All connections can be made without stopping the engine. A qualified operator can use the analyzer competently after a few hours' instruction.



#### Pocket Size pH Meter

L-2 Many industry problems involving pH control — acidity and alkalinity—can now be quickly and accurately re-

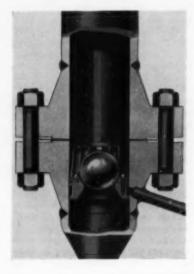
solved with a Pocket pH Meter produced by the Beckman Scientific Instruments Division. 2500 Fullerton Rd., Fullerton, Calif. This pocket-sized, pocked-priced instrument gives on-the-spot pH readings in the laboratory, plant or field for less than \$100.

The meter is valuable for a wide variety of pH applications in the power industry; for example, in testing feed waters to prevent equipment and pipe line corrosion, and in spot-checking automatic systems that control wash, waste, cooling tower, blowdown and boiler waters.

The meter is 6" long, 3" wide, 2" deep and weighs only 2 lbs. Measurements in the range of 2 to 12 pH are possible with readability of .1 pH. The seldom encountered lower pH values can be measured by a simple adjustment. Power is supplied by six, easily-replaced, standard-type batteries.

#### Variable Orifice Desuperheater

The new Variable-Orifice Desuperheater, a product of Copes-Vulcan Division. Blaw-Knox Company, Erie 4, Pa., represents an advanced approach to desuperheater design. Tests over such a wide load range as 50 to 1 show that reduced steam temperature can be held constant to meet the most rigid quality demands only 20 ft downstream from the desuperheater outlet.



No long run of piping is needed to mix cooling water intimately with steam. There are no spray nozzles, traps, glands or stuffing boxes to require maintenance. No atomizing steam is needed.

The desuperheater consists of a section of steel pipe enclosing a self-regulating orifice extending around the full 360 degrees and a weighted ball held in concentric position by Inconel springs. Cooling water, under the control of a Copes-Vulcan diaphragm-operated valve responsive to a temperature controller, enters the orifice chamber at a uniform rate of flow around the full 360-degree periphery.

In operation, the force of the steam flowing through the desuper-heater raises the ball an amount determined by weight of the ball and amount of steam flow. Each rate of steam flow gives the ball a different position, with a practically-constant pressure drop — normally 3 to 4 psig — for all flows.

Cooling water enters the steam at the seat of the orifice, the point of highest pressure drop. With the ball held in concentric position by the springs, the incoming steam flows uniformly around the 360-degree periphery through which the cooling water is introduced. Introduction of cooling water is further aided by the aspirating effect created by pressure drop in the steam passing through the annular restriction between the ball and ring.

The result is high turbulence regardless of rate of flow, with instant and intimate mixing of cooling water into the steam for complete vaporization. Since the desuperheater body is always mounted vertically, water not immediately absorbed remains in suspension until completely dissipated.

Using a standard temperature controller with both proportional and reset features, the Variable-Orifice Desuperheater holds final temperature within plus-or-minus 5 degrees F. Final temperature may be as low as 10 degrees F above saturation temperature.

The new desuperheater is available for pipe line sizes from 2 to 14 in., and for pressures up to 2500 psig.

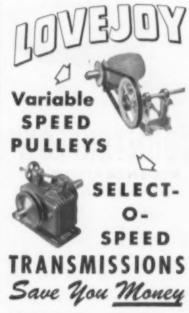
For More Free Data CIRCLE CODE NO. on the Handy Return Cord — Page 89

#### Direct Fired Oil Heater for Transfer Oils & Liquids

A new direct fired oil heater for heating transfer oils
or other liquids to temperatures up to 600 F has been
announced by Cleaver-Brooks Company. 326 East Keefe Ave., Milwaukee, Wis. The heat transfer oils may
be circulated through coils, molds,
jacketed vessels and other heat exchange equipment to provide higher
temperatures than can be economically obtained with high pressure
steam.

Forced internal circulation design of the new Industrial Peak-Temp Oil Heater provides high velocity flow of the heat transfer oil over the heating surfaces. Uniform oil temperature eliminates hot spots, coking or deterioration of the heat transfer oil. A simple fire brick ring in the burner throat is the only refractory used.

The Industrial Peak-Temp Oil Heater is used wherever heat is required for the manufacturing process, storage, transportation or ultimate use of the product. Unit is fired with oil, gas or combination oil gas



#### HERE'S WHY

- ECONOMICAL IN COST compared to other variable speed transmission equipment. Simple in design but rugged in construction to give you long dependable service.
- Easily installed on new or old equipment. Just as easy to operate.
   Finger-tip adjustment gives the right speed instantly.
- MAINTENANCE IS NEGLIGIBLE. No complicated mechanisms to get out of order. All parts can be readily inspected. Belts can be quickly adjusted or replaced.

#### Lovejoy Variable Speed Pulleys



are available in a complete range of sizes from fractional to 15 hp., ratios to 3 to 1.

Shown is a typical Lovejoy countershaft unit controlling speed of automatic spring coiler.

#### Lovejoy Select-O-Speed Transmissions

can be supplied with hand wheel or lever control. Fractional to 5 hp., ratios to 10 to 1.

This Lovejoy Select-O-Speed is used to control the speed of a printing press.



#### REPRESENTATIVES

ALABAMA: Birmingham—125 N, 41st Street FLORIDA: Miami—423 N, E, 71st Street Tampa—3313 W, Sevilla Circle MISSOURI: St. Louis—7530 Forsyth Blvd. Kansas City—1733 Main Street TEXAS: Houston—1200 Jackson Street VIRGINIA: Richmond—304 E, Main Street GEORGIA, NORTH CAROLINA, SOUTH CAROLINA, Greenville, South Carolina—P, O, B, 3175

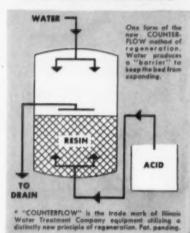
Request Catalog

## LOVEJOY FLEXIBLE COUPLING CO.



## **COUNTERFLOW**

REGENERATION OF ION-EXCHANGERS



- Ion leakage is reduced to about 1/3 of the amount common to conventional regeneration techniques.
- There is an increase of approximately 10% in cation resin capacity, with no increase in amount of acid regenerant.
- Removal of organics from the resin is improved.
- The possibility of talcium sulfate precipitation is decreased, permitting single-stage regeneration.
- Rinse water requirements are reduced.
- In systems using a two-bed deionizer shead of a mixed-bed unit, ions can be removed more completely in the more efficiently regenerated two-bed unit, thereby reducing the load on the mixed-bed unit.

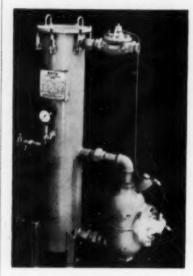
Present users of "COUNTERFLOW" are enjoying IMPROVED purity of effluent at LOWER cost of regenerant materials. One power plant, for example, is saving \$16,000 a year on acid alone since converting existing de-ionizers to COUNTERFLOW design.



ILLINOIS WATER TREATMENT CO. 840 Coder St. Reckford, III.

NEW YORK OFFICE: 141 E. 44th St., New York 17, N.Y.
'ANADIAN DIST.: Pumps & Softeners, Ltd., Landon, Ont.

#### New Product Briefs (Continued)



#### Liquid Separator Filter

A new rugged filter-separator of the replaceable-cartridge type by Richmond Engineering Company. 7th & Hospital Sts., Richmond 5, Virginia, will remove condensed water, waterborne contaminants and solids from fuels, oils, solvents and other oleaginous liquids at flowrates of from

5 to 40 gpm with 100% effectiveness. It is also suitable for a wide variety of aqueous solution treatments.

Known as the SV-11 or SV-11A (the final letter designating the use of a knockdown shroud around the main separator cartridge when water is the chief contaminant to be removed) the unit stands vertically on just one sq ft of floor space, and has 1¼ in. horizontal inlet and outlet connections at 3 in. and 52 in from the floor respectively.

Maximum working pressure is 150 psi. Constructions for higher pressures may be had on application. Initial pressure drop is only about one psi. Automatic controls (on the SV-11A) handle the continuous discharge of separated water and prevent slugs from working up into the clean fuel outlet.

Rated at 15 gpm, the new Recounit will handle light fuels like gasoline at from 30 to 40 gpm, kerosenes and jet fuels at 20 to 25 gpm, and heavy diesel fuels at 10 gpm. Features include (1) complete removal of undissolved water from hydrocarbon liquids, (2) retention of all solids over 5 microns in size, (3) simplicity, (4) operability under vibration or tilt up to 45 degrees, and (5) easy replaceability of the low cost cartridge.



### Quick-Load Vise for Circular Saw Filing

Circular saw blades of 4"
to 18" diameter may be sharpened quickly and accurately with the new Foley Model 346 filing vise, produced by the Foley Mfg. Co., 3600 N. E. Fifth St., Minneapolis, Minn.

Blades with arbor holes of \%" to 1\%" slip over a threaded stud as-

sembly and are held firmly in place by a cone that engages stud threads when a plunger is released. The cone is then turned for desired amount of tension, allowing blade to be rotated by file pressure to bring each tooth into position.

This slip type saw cone remains together at all times, so there is only one piece to release for reversal or removal of saw blades. The rigid back vise supports the blade at filing point to prevent chatter. When filing large saws, a spring tension lever swings down over the blade for increased tension and to prevent vibration.

Adjustment is fast and positive. Saws may be filed either vertically for straight across filing, or locked at any desired tilt angle to 45°. Slotted angle adjustment bar is stamped with markings of 15°, 30°, and 45° for accurate positioning at desired slant. A single lock-tight hand wheel provides vertical positioning of blade so that teeth extend just above the top of the vise.

### Instrument Detects Line-to-Ground Faults

Line-to-ground faults in 440 volt, 3 - phase ungrounded electrical systems are instantly detected, and both visual and auditory warning given by the new Delta-Desco Electronic Ground Alert recently developed by Delta Engineering Sales Co., Box 140 3BK, Shreveport, Louisiana.



It is available in a Stationary Type for permanent installation, and a Portable Type (illustrated) for convenient use around a plant.

Under normal conditions, voltage from all phases to ground is about half the line voltage; but when a "Full Ground" occurs on a single phase, voltage from the faulted phase to ground is zero, and voltage from the other phases to ground is "Full Line Voltage." This stress on insulation ultimately causes a dead short, with resulting damage and shutdown of equipment, possible fire and injury to personnel.

The Ground Alert gives immediate and positive indication of ground faults well before insulation resistance drops to zero ohms (a dead short), thus allowing the trouble to be located and corrected before serious damage occurs.

An important feature of the Delta-Desco Electronic Ground Alert is that it can be factory adjusted to indicate any desired minimum resistance to ground from 7,500 ohms to zero ohms. A green light indicates the system is normal and ungrounded. A red light comes on and the green light goes out when minimum desired insulation resistance is reached in any phase. When the red light goes on, a bell begins to ring and does not stop until manually shut

off with the switch on the Alert Panel. The instrument anticipates trouble before it occurs; serious trouble does not usually result until the second phase ground occurs. Other Alerts are available for 220 volt, 3-phase ungrounded systems, 2,300 volt and 4,160 systems.

#### Combination Regulator Filter and Lubricator

A complete package unit for compressed air operations by Perfecting Service Company, 332 Atando Ave., Charlotte 6, N. C., accurately regulates to desired pressure, filters water and dirt from the air line and lubricates the air stream with a fine fog-like oil mist.

It is offered ready to install and requires only two connections; available in ¼", %" and ¾" pipe sizes.

Regulator operates on balanced piston principle; cylonic action within filter bowl removes dirt and water; and external oil adjustment meters lubricant. Brochure No. 80 describes the complete PSC Air Control line.

#### **Electro-Hydraulic Operators**

A new line of completely self-contained Electro-Hydraulic Valve Operators has been developed by Fisher Governor Company, Marshalltown, Iowa.

They produce high performance without the use of electronic amplification, utilizing only simple direct current actuated force motors to operate the hydraulic pilot. Nozzle-flapper combinations are used in the pilot to control hydraulic pressure, eliminating sliding plate or spool type valves which are easily stuck.

Two series of operators are available. Type 340 can be mounted on valve sizes ½" to 4" and will develop stem thrusts up to 600 lb. Type 350 can be mounted on valve sizes ½" to 16" and develops stem thrusts up to 2000 lb. Both operators may be adapted to operate on the DC input signal from any instrument currently available.

For More Free Data CIRCLE CODE NO. on the Handy Return Card — Page 89





#### makes the DIFFERENCE!

PACO PLASTIC makes the difference between an efficiently operated boiler and one that is constantly in need of repair! PACO PLASTIC forms a solid, joint-free monolithic wall that prevents heat and gas leakage. Quickly applied with unskilled labor and can be fired immediately! Free estimates at no obligation!

NORTH STATE PYROPHYLLITE CO. INCORPORATED

GREENSBORO, N.C. Ph. BRoadway 2-7763

#### CALL YOUR NEAREST DISTRIBUTOR

Deeds Boiler Ca., Roanoke, Va.
Portsmouth Boiler & Iron Warks, Portsmouth, Va.
Portsmouth Boiler & Iron Warks, Portsmouth, Va.
Dillon Supply Company in Raleigh, Racky
Mount, Goldsboro and Durham, N. C.
Queen City Engineering Ca., Charlotte, N. C.
L. L. Goodman & Son, Hickory, N. C.
J. L. Goodman & Son, Hickory, N. C.
Joe Moore & Company, Raleigh, N. C.
Summers Hawe. & Supply Ca., Johnson City,
Ten.
McBurney Stoker & Equip. Co., Atlanta, Ga.

Brown-Ragers-Dixon Co., Spartanburg, S. C. Applied Engineering Co., Orangeburg, S. C.

DEALERS IN MOST TOWNS AND CITIES

#### New Product Briefs (Continued)

#### PVC Valve - Socket Ends

L-10 Box 360, Cincinnati 14, Ohio, announces the addition of valves with socket ends to its line of Luncor PVC valves.

Designated as Fig. 2601, the new Luncor socket-end valve is readily installed in PVC pipe lines by solvent welding. This is a fast and easy method of connecting PVC valves to pipe, and produces high joint strength.

Solvent cements suitable for joining the new Fig. 2601 Luncor valve and PVC pipe are available commercially. The Luncor Fig. 2601 valve is rated 125 WP and 140 F—identical to the Luncor Fig. 2600 valve with screw ends.

These money - saving, high - performance valves have been particularly successful in handling most common corrosive solutions in industrial operations, chemical processing, and marine installations.



**Automatic Grease Cups** 

L-11 Greasing electric motors, pumps, blowers, shafts, fans and other machinery by hit or miss guesswork methods is completely eliminated with new Visiball Automatic Grease Cups,

available from the Visiball Manufacturing Co., Box 7021, Fort Worth, Texas.

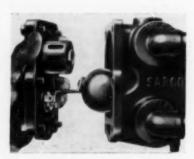
The new cups replace existing grease fittings, grease cups and other lubricating devices and completely eliminate human judgment which frequently results in burned out machinery from too little grease or damaged bearing seals and equipment from over-greasing.

The heart of the Visiball Grease Cup is a neoprene disc which can be inflated into a ball, holding up to 2 ounces of grease. The disc or ball is filled with a standard grease gun through a fitting on the side of the chrome plated zinc alloy housing. Protecting the neoprene ball is a clear lucite plastic cylinder, through which the maintenance man can clearly see the ball as it fills with grease.

As the bearing uses grease, the ball deflates, indicating the quantity of grease remaining. It is not necessary to refill the cup with grease until the neoprene disc returns to the deflated position.

Because of the compression of the neoprene ball and the vacuum created by the motion of the shaft, grease is fed automatically into the bearing only as it is needed.





#### Improved Steam Trap

L-12 Inspection, maintenance and installation is simplified in the improved Float-Thermostatic steam trap of Sarco Company, Inc., 350 Fifty Ave., New York 1, N. Y.

Entire operating element is one unit, which can be removed without disturbing inlet and outlet connection to the body. Unit suitable for 125 psi steam pressure and is designed to provide condensate seal and prevent loss of steam. Recommended for drip steam mains, unit heaters, blast coils, heat exchangers and other allied process applications requiring accurate temperature control.

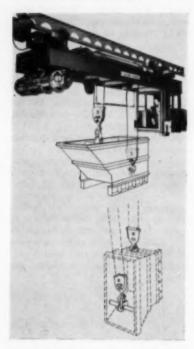
100

McKEES ROCKS, PA. (Pittsburgh District) Federal 1-7750

#### Tramrail Carrier With Dumping Hoist

A cab-controlled twinhook hoist carrier provided with an auxiliary hoist for dumping has been built by the Cleveland Tramrail Division. The Cleveland Crane & Engineering Co., Wickliffe, Ohio.

Of weatherproof construction for outdoor service, the unit will pick up tote boxes of materials, haul them and empty by tipping. While the carrier was especially designed



for handling slag in a steel mill, it is suitable for a wide variety of materials such as castings, bolts, nuts and other machined parts, sand and various bulk materials.

Hoisting and travel motions are controlled by the cab operator. The main hoist alone raises or lowers a tote box in upright position. Hoist speed is 35 fpm. Travel speed is 250 fpm. Variable speed drum controllers are provided.

Capacity is 12,000 lbs, i.e., 6000 lbs per hook. Other carriers of different capacities can be furnished.

#### **Motor Starters**

A new line of 2300 to 4160volt starters (Type H) for full or reduced voltage starting, reversing or non-reversing, dynamic braking or multi-speed control of squirrel-cage, synchronous or wound rotor motors has been announced by Allis-Chalmers, Milwaukee 1, Wisc.

Completely front accessible, the new starter is compact and versatile with the basic unit measuring only 34 in. wide by 32 in. deep.

All components of the new starter were separately tested to prove individual ratings and mechanical strength. In addition, the completed starter was successfully subjected to a 19-kv, 60-cycle dielectric test for one minute, a 60-kv impulse test, and short circuit tests of 150,000 kva at 2300 volts and 250,000 kva at 4600 volts.

The new starter is available with either air break or oil immersed contactors up to 1500 hp at 2300 volts or 3000 hp at 4600 volts. Short circu t protection of 150,000 kva at 2300 volts and 250,000 kva at 4160 or 4600 volts is provided by current limiting fuses.

For More Free Data CIRCLE CODE NO. on the Handy Return Card — Page 89

#### Non-Lubricated Ball Valve

A new plug valve, the
ACF non-lubricated ball
valve, has been announced
by W-K-M, division of ACF Industries, Inc., Box 2217, Houston, Texas.

Under development and test for some time, the new valve has been successfully used by widely diverse industries including chemical plants of all types.



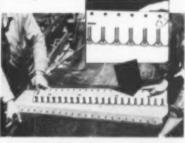
Outstanding characteristic of the ACF ball valve is its leakproof twoway seal with round, full-pipe area. Other features are quarter-turn opening and closing, fully protected seating surfaces, chrome-plated ball for extra resistance to wear and corrosion and a minimum number of parts with resulting minimum maintenence.

# FLEXCO POWER TOOLS CUT APPLICATION TIME IN HALF

Your two man belt team can now join a belt 30" wide in 15 to 20 minutes . . . using the new FLEXCO Power Tools.



The FLEXCO Power Tool Boring Bit used with electric or air impact tool speeds boring of holes.



New FLEXCO Templet positions bolts for quick joining of belts. Reaching under belt has been eliminated.



Running down nuts is fast with the new FLEXCO Power Wrench used with electric or air impact tool. Two Bolt Breakers are used together to complete the joint.

If you are interested in speeding up fastener application, order the new Power Tools from your local FLEXCO Distributor. Write for Bullatin F-112-A.

#### FLEXIBLE STEEL LACING CO.

4625 Lexington Street . Chicago 44, Illinois

#### New Product Briefs (Continued)

#### **USE SPI** READER SERVICE

(See Card on Page 89)

#### Continuous Cable Clamp

A new fitting available from Sauerman Bros., 620 L-16 S. 28th Ave., Bellwood, Ill., provides a quick way of attaching a load to a continuous cable. The clamp is being used for car pulling, barge moving, rigging or any job where a load must be connected to a line.

The three-part fitting consists of a wedge clamp, wedge, and cable clip. To attach the load to the cable, the wedge clamp is placed on the cable with the small end in the direction of the cable pull. The wedge is then inserted. The cable clip passes through the eye of the wedge and locks it in place. A clevis

and pin are frequently used to attach the load to the clamp.

Sauerman continuous cable clamps are manufactured for rope sizes from % to 1% inches.



#### Stud Welding Gun

A new small stud welding gun, weighing one - third L-17 less than any unit previously marketed and designed to weld studs faster and more reliably, has been introduced by the Nelson Stud Welding Division of Gregory Industries, Inc., Lorain, Ohio.

Called the Nelson NS-10, the gun s so balanced that it is as easy to handle as a hammer. Despite its small size, this gun will weld all studs up through %-in. in diameter. The gun weighs less than 4 lb and measures only 9 in. in length.

#### Chemical Cleaners for Boilers & Industrial Equip.

New chemicals claimed to L-18 simplify cleaning of boilers and industrial equipment are being marketed by National Aluminate Corporation, 6226 West 66th Place, Chicago 38, Ill.

Nalco 85 - a boiler cleaning aid and supplementary treatment is alkaline in nature and may be applied to an operating boiler. It is particularly effective in dispersing calcium carbonate deposits. Unlike acid materials, it does not require neutralizing after cleaning.

Nalclean 66 and 68 (for industrial process and heat exchange equipment) are blends of both organic and inorganic acids and are effective in removing a wide variety of scale and deposits. They contain corrosion inhibitors which protect all metals commonly found in industrial equipment. They are manufactured in dry, pulverized form and incorporate an indicator dye to give visible evidence when solution strengths are depleted.

#### **FABRICATORS** of Industrial Sheet Metals

Sheet Light Structural

Production Methods for Custom Built Itoms. We Fabricate Metal Parts Singly or in Quantities.

#### Industries Served

- · Textile Mills
- · Woodworking
- Steel Mills
- Metalworking
- Paper Mills
- Food Processing
- Shipbuilding Foundries
- · Defense Plants
- Aireraft
- · Building Contracts
- · Air Conditioning
- Food Mills
- Electrical
- Chemical Plants
- - Replacement Items for Plant Maintenance

ENGINEERS ... DESIGNERS FABRICATORS ... MANUFACTURERS

Let us help you solve your fabri-cating problems. Send us your drawings for quotations or write regarding needs and problems.

#### **ENGINEERING SALES**

BOX 735

GADSDEN, ALABAMA

Plant at 524 Locust St. Phone Liberty 6-0441

#### FUTURE EVENTS of Engineering Interest

Nov. 14-15; 6th Annual Conference, Textile Ind. Subcommittee of Gen. Industry Applications Committee of AIEE and N. C. State College, Riddick Laboratory Auditorium, Raleigh, N. C. I. S. Bull, Firestone Textiles, Div. of Firestone Tire & Rubber Co., Gastonia, N. C.

Nov. 22: Panhandle Plains Regional Meeting, Natural Gasoline Association of America, Herring Hotel. Amarillo, Texas, William F. Lowe, Secy., NGAA, 421 Kennedy Bldg., Tulsa 3, Okla.

Dec. 2-6; 26th Exposition of Chemical Industries. New York Coliseum, New York, N. Y. Internation Exposition Co., 480 Lexington Ave., New York 17, N. Y.

Jan. 31; Oklahoma Regional Meet-

ing, Natural Gasoline Association of America, Skirvin Hotel, Oklahoma City, Okla. William F. Lowe, Secy., Natural Gasoline Assoc. of America, 421 Kennedy Bldg., Tulsa 3. Okla.

March 17-19; American Power Conference, Chicago, Ill. R. A. Budenholzer, Director, Am. Power Conf., Illinois Institute of Technology, Chicago 16, Ill.

March 17-21; 4th Nuclear Engineering & Science Conference & Exposition, Chicago, Ill. For information write Atomic Exposition, 117 South 17th St., Philadelphia 3, Pa.

April 16-18; Natural Gasoline Assoc. of America, Annual Convention, Baker and Adolphus Hotels, Dallas, Texas.

May 12-16; Southwestern Metal Exposition, State Fair Park, Dallas, Texas. W. H. Eisenman, Mgr. Dir., 7301 Euclid Ave., Cleveland 3,

#### Incentive Plan

(Continued from Page 60)

has produced each day. These are recorded in the payroll clerk's office. Explains Superintendent Weed, "We guarantee each production worker his base contract pay for all hours on the job. All production over the standard for a given eight-hour day nets him added 'bonus pay.' But we still pay him his base rate when he works below the 100-per-cent efficiency level for the week.

"The amount of production needed is determined by the orders and anticipated sales for a given period. With our cost system we can determine the labor hours for all production in advance.

"The key to successful woodwork manufacturing is the teaming of a good standards engineer, machining and assembly foremen, office employees and production workers properly trained to do the job the way you have engineered it to produce a quality product."

#### Dry Air

(Continued from Page 51)

cally or horizontally for best space utilization or simplest piping. Water flows through the aftercooler in a direction counter to the air flow, so that the water inlet is at the air discharge end of the cooler.

Automatic valves may be used to control the water flow. Discharge water from the aftercooler can then be used for compressor cooling. This slightly cooled water is better for this service than extremely cold water.

Air from the aftercooler enters the head of the receiver and the drops of water fall to the bottom where they are drained out. A thermometer in the cooler outlet permits the operator to make certain that the correct amount of cooling water is being used. For protection, a pop safety valve must be placed between the compressor and the aftercooler, or any possible source of obstruction in

the air lines.

The proportions of a good aftercooler are such that the air will
be cooled to within 10 F of the
cooling water temperature with a
flow of 1 to 2 gallons of water per
minute for each 100 cu ft of air
that is compressed to 100 psi. With
an aftercooler designed according
to this principle, water at 75 F
or below would be adequate to
completely dry the air in the previously described sandblast installation, where 2 gal of water
per hour were condensed on a
hot, humid day.

#### **Moisture Separator**

Any water carried through the receiver can be removed by a moisture separator. The type illustrated consists of a cylindrical chamber into which the air flows tangentially, producing a swirling motion. The drops of water, which are heavier than air, are thrown to the walls of the chamber. From here they run down into the drain at the bottom of

the separator, where they are expelled automatically by a trap, or manually by a valve. The air flows through a filter made of porous material which permits the passage of air, but prevents the passage of water and oil.

When the separator is 'ocated at the outlet of the aftercooler, it may be overburdened, for it will have to remove all of the moisture. It is better practice to place it in the line from the air receiver. When this is done, much of the moisture will first drop out in the receiver, leaving less work for the separator. The result will be drier air.

By realizing these characteristics of compressed air, and by properly applying the drying techniques discussed here, it should be possible to eliminate costly water from practically any compressed air system. Paint jobs will be improved, and blasting will be more efficient, and the life of air tools and air piping will be lengthened.



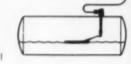


# 100%

Dependable remote reading tank contents gauges using a closed hydraulic transmission system. No power required.

Several sizes available. Approved by Underwriters Laboratories and Factory Mutual. UL approved switches.

Write for complete details, to Dept. F.





THE LIQUIDOMETER CORP. LONG ISLAND CITY I. NEW YORK THRU YOUR DEALER OR DIRECTLY FROM

BUY CLOSE-COUPLED

CHAS. S. LEWIS & CO., INC.

8601 GRANT ROAD . . ST. LOUIS 23, MO.

## Classified Advertisement

Classified rates are net, payable in advance, each month. Rates are based on column inch, with three columns per page, 10 inches per column, column width 31/4 inches - a total of 20 column inches per page.

#### CLASSIFIED RATES

\$16 per column inch \$24 per column inch displayed Rates quoted on special types of repeated

advertisements.

Special "Position Wanted" Advertisements submitted by individuals seeking employment, 10 cents per word per insertion, payment with order, minimum charge \$5.00. When used, Box Number address, c/o SOUTHERN POWER & INDUSTRY, 806 Peachtree Street, N.E., Atlanta 8, Georgia, count as eight words.

## HIGH DOLLAR

#### - FOR USED TRANSFORMERS

Your used transformers are worth y! Send us a description and tell you what they're worth! We build transformers and coils to your specifications. Send us your blueprints for prompt quota-

TRANSFORMERS BOUGHT, SOLD, REPAIRED and RENTED 45 Years of Dependable Service

THE ELECTRIC SERVICE CO.

\$323 Hetzel St., Cincinneti 27, Ohio

#### FOR SALE

TWO Titusville Type A-4-26, 3 drum bent tube, water tube boilers, 6,109 sq. ft. heating surface, 200 psig design pressure, manufactured in 1952, complete with standard trim and supporting steel, not presently equipped with superheaters but designed for superheater installation. Recommended continuous operation load 200%. Manufacturers' Data Report and Certified Prints are available for inspection. Boilers are not now in use and may be inspected by appointment. be inspected by appointment.

SOUTHERN PINE LUMBER COMPANY Diboll, Texas

RENEW

YOUR SUBSCRIPTION

TO

SOUTHERN POWER AND INDUSTRY

#### SOUTHERN POWER & INDUSTRY

The Industrial and Power Journal of the South and Southwest



## for Tanks or Smokestacks call FINNIGAN Specialists

TANKS. **SMOKESTACKS** PIPING, BREECHING PLATE WORK WATER **HEATERS** 

BOILERS

Skilled craftsmanship and over 60 years of experience made the erection of the two 40' 0" (dia) x 30' oil storage tanks and three smoke stacks (illustrated above) for Graniteville Company, S.C., a routine assignment.



P. O. BOX 6025, HOUSTON 6, TEXAS

3714 14th ST., N. W., WASHINGTON, D. C. 230 NORTH TORRENCE ST., CHARLOTTE, N. C. 41 E. 42nd ST . NEW YORK 17. N. 1 SBI S. W. 47th ST., MIAMI, FLA

4431 MAPLE AVE. DALLAS 9, TEXAS
P. O. BOX 2527, JACKSONVILLE 4, FLA.
4108 C. ST., LITTLE ROCK, ARK.
4084 THALIA AVE., NEW ORLEANS 25, LA



Write today for **Bulletin PB1-56** 

gives fast action. It's a miser on fuel, and completely automatic. Heats objects, not the surrounding air. No fans, no blowers, no moving parts. PANELBLOC actually "HEATS LIKE THE SUN", the true infrared heater.

THERMOBLOC DIVISION PRAT-DANIEL CORPORATION 11-11 Meadow St. So. Nerwalk, Conn

ARE YOU READING SOMEBODY ELSE'S COPY OF SPI . . . ?

Why not get your own subscription so you can always be sure of seeing each issue

SOUTHERN POWER & INDUSTRY 806 Peachtree Street, N.E. Atlanta 8, Georgia

☐ New Subscription ☐ Renewal

Enter my subscription to SOUTHERN POWER & INDUSTRY for 3 years

Stote

P. O. Box or Street and No.

Name of Firm.

Enclosed find \$3.00

☐ Bill me for \$3.00



#### ALL-PURPOSE DURASHEATH CUTS COST

Anaconda's neoprene-jacketed Durasheath\* cable cuts installation costs because it can be installed in ducts, buried, aerially or any combination of these in one run-with minimum splicing. It reduces maintenance and replacement costs because its rugged jacket resists abrasion, moisture, corrosive chemicals and oils that shorten ordinary cable life. Available in all sizes, single and multiple conductor, copper or aluminum, 600 to 15,000 volts. For full information, write: Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.

#### ANACONDA°

SReg. U.S. Pat. Off.

#### Hotel PITTSBURGHER

## Right in the Heart of the Golden Triangle

400 outside rooms with bath. Largescreen television and radio at no extra charge in every room.

Air conditioning. Finest dining room.

DIAMOND STREET BELOW GRANT

ATlantic 1-6970

#### **Handiest Locations** in PITTSBURGH

#### Hotel Pittsburgher MOTEL

Opposite Greater Pittsburgh Airport on Airport Parkway west. 56 air-conditioned rooms with largescreen television at no extra charge. Tile bath. Private phone. Restaurant facilities. Courtesy car to and from airport.

AMherst 4-5152

Teletype Service. For immediate confirm telephone any Knott reservations at no charge Motel—or teletype PG-29





## Index of Advertisers

This Advertisers' Index is published as a convenience, and not as a part of the advertising contract. Every care will be taken to index correctly. No allowance will be made for errors or failure to insert.

A	Fiske Bros, Refining Co., Lubriplate Div.	Peerless Pump Division, Food Machinery
Advertising Council  Air Preheater Corp. 21 Allen-Bradley Co. 3 Allis-Chalmers Mfg. Co. Second Cover American Blower Corp. 26 & 27 American Cancer Society American Engineering Co. 4 American Edgineering Co. 4	Flexible Steel Lacing Co. 101 Fly Ash Arrestor Corp. Foster Engineering Co.	& Chemicals Corp. Pittsburgh Piping & Equipment Co. Porter, Inc. H &
Air Preheater Corp. 31	Foster Co., L. B.	Powell Valves
Allis-Chalmers Mfg, Co. Second Cover	Foster Co., L. B. Foster Wheeler Corp. Frick Company	Porter, Inc., H. K. Powell Valves 75 Prat-Daniel Corp. 105 Preferred Utilities Mfg. Corp.
American Blower Corp. 26 & 27	Tree company	referred Cunties saig. Corp.
American Engineering Co. *	G	
American Manager Co.		Q
American Monoraii Co. Ames Iron Works, Inc. Anaconda Wire Cable Co. Anderson Chemical Co., Inc. Armco Drainage & Metal Prod., Inc.	Garlock Packing Co.  General Coal Co.  General Electric Co.  Goulds Fumps, Inc.  Grinnell Co., Inc.  Gulf Oil Corp.	Queen City Engineering Co. *
Anaconda Wire Cable Co. 105	General Coal Co.	dates try ingineting to.
Armeo Drainage & Metal Prod., Inc.	Goulds Pumps, Inc.	
Aseeco, Inc. Atlantic Steel Company 87	Grinnell Co., Inc. 20	R
Attantic Steet Company	trait in two.	Reliance Gauge Column Co. 92
	Н	Reliance Gauge Column Co. 92 Republic Flow Meters Co. 77
В	"	Richardson Scale Co. Riley Stoker Corp. Robyon Backing Ring Co. Roper Corporation, Geo. D. Ross-Heat Exchanger Div. of American
Habbitt Steam Specialty Co. Habcock & Wilcox (Bollers) Balley Meter Co. Belmont Packing & Rubber Co. Bird-Archer Co.	Holmar Corp. • Hotel Pittsburgher 105	Robyon Backing Ring Co.
Babcock & Wilcox (Bollers) 84 & 85	Hotel Pittsburgher 105	Ross-Heat Exchanger Div. of American
Belmont Packing & Rubber Co.		Radiator & Standard Sanitary
Bird-Archer Co. Bituminous Coal Institute	1	Corp.
Hitaminous Coal Institute Hlackmer Pump Co. Rlaw Knox Company	Illinois Water Treatment Co	
	Ingersoll-Rand Co. 63	5
Commercial Grating Hlaw-Knox Co., Copes-Vulcan Div. 61		Sarco Co., Inc. 39
Hotler Tube Co. of America 100	J	Sinclair Refining Co.
Borden Metal Products Co. 42 Brook Motor Corp. 108		Southern Engineering Co. Southern Power & Industry 105
Brown-Bovert Corp.	Jeffrey Mfg. Co.  Jenkins Bros.  Third Cover	Southern Power & Industry 105 Southern Valve Corp. Sprague Electric Co.
Buffalo Forge Co., 1nc. 87	Total Cores	Sprague Electric Co.
Bunting Brass & Bronze Co. 92	K	Sprague Electric Co. Standard Oil Co. Sterling Electric Motors, Inc. Stone & Webster Engineering Corp. Sturtevant Div., B. F., Westinghouse Elec Co.
Circulation, Inc. 81	"	Stone & Webster Engineering Corp. Sturtevant Div. R. F. Westinghouse
Hlaw-Knox Co., Copes-Vulcan Div. 41 Holler Tube Co. of America Borden Metal Products Co. 42 Hrook Motor Corp. 48 Hrown-Boveri Corp. 48 Buell Engineering Co., Inc. 47 Bunting Brass & Bronze Co. 47 Bunting Brass & Bronze Co. 47 Bunting Brass & Bronze Co. 47 Business Publications Audit of Circulation, Inc. 41 Bussmann Mfg. Co. 4 Byers Co., A. M. 4	Kalamazoo Tank & Silo Co.  Kano Laboratories  Keeler Co., E.  kellorg Company, M. W.  Kieley & Mueller, Inc.	
Byers Co., A. M.	Keeler Co., E.	Subox, Inc.  Superior Combustion Industries, Inc.  *
	Kellogg Company, M. W. 7	Department Communities and Com
C	Kieley & Mueller, Inc.	
Catawissa Valve & Fitting Co. Chapman Valve Mfg. Co. Cherry Way Corp. Chesapeake & Ohio Railway Co. Clarage Fan Co. Classified Ads Cleaver-Brooks Co. Cochrane Corporation Combustion Engrg., Inc. Combustion Equipment Division, Todd Shipyards Corp.		T
Chapman Valve Mfg. Co. 40	L	Terry Steam Turbine Co., The
Cherry Way Corp. 105 Cherry way Corp. 188	Ladish Co	Texas Co. *
Clarage Fan Co. 0	Leslie Co	Texas Co. Thermobloc Div., Prat-Daniel Corp. 195 Thomas Flexible Coupling Co. Todd Shloverde Corp. Combustion
Classified Ads Cleaver-Brooks Co.	Liquidometer Corp. 104	Todd Shipyards Corp., Combustion Equipment Division
Cochrane Corporation	Ludish Co. Lesife Co. Lewis & Co., Inc., Chas. S. Liquidometer Corp. Lovejoy Flexible Coupling Co. Lubriplate Division, Fiske Bros.	Extraparent Envision
Combustion Engrg., Inc. Combustion Equipment Division, Todd	Lubriplate Division, Fiske Bros. Refining Co.  Lunkenheimer Co.  71	
Shipyards Corp.	Lunkenheimer Co. 71	U
Shipyards Corp. Continental Gin Co. Copes-Vulcan Division.		Uniblow Valve Co. *
	M	Uniblow Valve Co. United States Steel Co. U. S. Treasury
Crane Company 60	Magnetrol, Inc.	U. S. Treasury
4	Manzel Division of Houdaille Industries,	
D	Manzel Division of Houdaille Industries, Inc. « Marley Co., Inc. «	V
Dameron Enterprises, Inc.	Mariey Co., Inc.  Mason-Neilan Division, Worthington Corp.  Midwest Piping Co., Inc.	
Dean Hill Pump Co.	Midwest Piping Co., Inc.	Vogt Machine Co., Henry *
Diamond Chain Co., Inc.		
Dean Hill Pump Co. Detroit Stoker Co. Damond Chain Co., Inc. Duraloy Company 86 Durametallic Corp.	N	W
Durametaine Corp.	7.	Walworth Co. 28
_	National Airoil Burner Co.	Walworth Co. 28 Want Ads 104
E	National Business Publications, Inc. 22	Wasses Frents A.
Eastern Gas & Fuel Associates	National Business Publications, Inc. 92 National Supply Co., Spang-Chalfant Div. * National Tube Co. 98	Wayne Manufacturing Co.
Ehrsam & Sons Mfg. Co., J. B. *		Warner Lewis Co. Warner Pumps, Inc. Wayne Manufacturing Co. Webster Engineering Co. Western Precipitation Corp. 73
Electric Service Co. 104 Elgin Softener	Niagara Blower Co. 95 Norfolk and Western Railway Co. *	Westinghouse Electric Corp.
Emerson Elec. Mfg. Co.	North State Pyrophyllite Co., Inc. 90	Westinghouse Electric Corp.,
Entectic Welding Alloy Corn. 78 & 79		Wheeler Mfg. Co., C. H. Fourth Cover
Evans Rule Co.  Everlasting Valve Co.	0	Wiegand Co., Edwin L. 96 Wilson, Inc., Thomas C. 9
Everlanding Valve Co.		minen, men, montas e.
	Otis Elevator Co	
F		Υ
Fairbanks, Morse & Co. 26	P	Yarnall-Waring Co. 14, 15 & 59
Fairbanks, Morse & Co. 36 Finnigan, J. J. Co., Inc. 105 Fisher Governor Co. 17	Parithe Bowns Inc	Yuha Consolidated Industries, Inc.,
Finite Governor Co. 17	Pacific Pumps, Inc. 29	Heat Transfer Division 65

Only the big line of JENKINS U-BOLT GATES has all these dollar-saving features

WIDE CHOICE

DESIGNED
TO COST LESS
TO USE



Built right into a Jenkins U-Bolt Gate Valve are dollar-saving features no other can match. Construction superiorities that equip this valve to take punishment longer . . . saving dollars in replacement bills. Features that cut maintenance time and the cost of replacement parts . . . saving more dollars. For a good example, look at the unique Renewable Bonnet Saver Bushing which is a patented feature of Inside Screw valves.



JENKINS
LOOK FOR THE RINGINS DIAMOND
VALVES
SINCE
SINC

Sold Through Leading Distributors Everywhere

#### Before you place your next order...

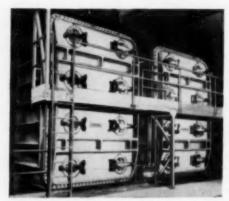


It's saved many weeks, even months of engineering and executive time for scores of power companies! Basically, the idea is to shift as much of the work load as possible from the customer to C.H. Wheeler. By working this way, long conferences are replaced by short phone calls, and lengthy customer-prepared engineering specifications are supplanted by thumbnail performance sheets.



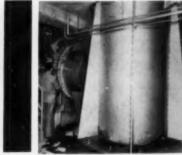
Since Wheeler specializes in designing and building condensing equipment, its Engineering Department is set up to take this bare minimum of data from the customer, and work up a comprehensive proposal from it alone. Here you see several department heads of C. H. Wheeler discussing engineering design prior to preparing a proposal for a C. H. Wheeler client.

## Discover C. H. Wheeler's time-saving way to buy steam condensers



We often save clients up to 4 months' time by sending Wheeler engineers to work "on the board" at clients' offices, instead of mailing drawings for approval. Above is a typical installation—a 105,000 sq. ft. Dual Bank Divided Water Box Unit, installed at a New York station.\* It condenses 950,000 lbs. steam/hr.





Other C. H. Wheeler power plant equipment includes steel-shell "Tubejet" Air Ejectors (left) as installed at eastern plant, Circulators (right) which in the same plant deliver 86,500 gpm water, and Condensate Pumps. See your representative or write for details on the time-saving way to buy Dual Bank Surface Condensers and other power equipment, "Names of these and other power stations equipped by C.H. Wheeler supplied on request.

C. H. Wheeler Mfg. Co.

19TH & LEHIGH AVENUE

Philadelphia 32, Pennsylvania